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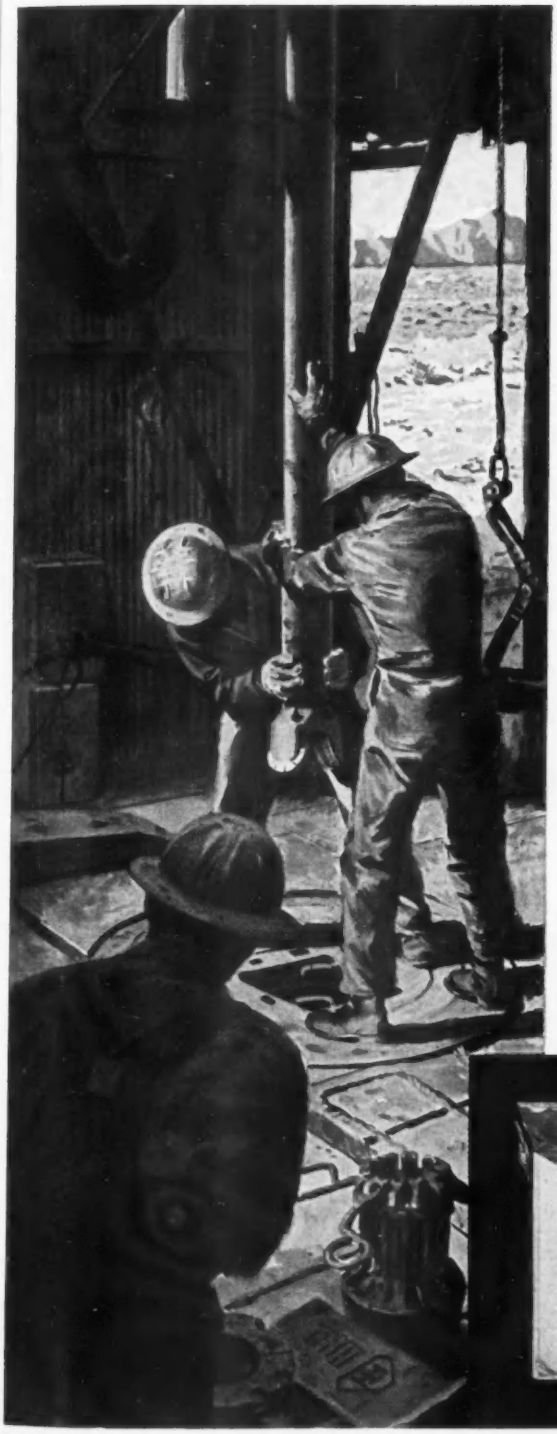

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WORLD OIL

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August 1, 1953 Vol. 137, No. 2

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A Quick Look at This Issue

BUSY OIL MEN: To help you put first things first, scan these time-saving digests on this and the following pages, checking ☑ those you want to read first.

CURRENT OUTLOOK

☐ **Improved supply of tubular goods is in sight . . .** North Dakota's first crude pipe line scheduled for November completion . . . Electricity may assume role as competitor to oil, gas and coal for heating purposes in year-round air conditioning . . . How will Eisenhower's stand affect Iranian oil? See *Looking Ahead*, Page 55.

☐ **A big fuss is being raised** over recent advances in oil prices. A congressional committee is investigating. Suggested remedies range all the way up the scale to absolute federal government control. Why investigate higher oil prices? What about cigarettes, milk, bread and hundreds of other commodities? The oil industry is being "picked on" again. See the *Editor's Page*, Page 57.

☐ **A gross investment of $44 billion . . .** that's the outlook for the petroleum industry by the end of 1953. Capital expenditures this year have reached a record-breaking $4 billion. For a quick check into this huge outlay and how the industry compares with others, see Page 58.

Turn the Page ➡

A QUICK LOOK . . .

☐ **Take their word for it . . .** safety directors need very little authority to do their jobs. WORLD OIL has surveyed 40 safety experts on such controversial questions as: Should you have the authority to penalize a worker? . . . to recommend a penalty? . . . to shut down an installation? For some answers that may surprise you, turn to **Page 60.**

☐ **Remember the bank holiday of 1933?** Robert G. Dunlop does, too—and not with sadness, either. It was that black period in U. S. business history that brought a blessing in disguise for Sun Oil Company's president, who this year is celebrating his 20th anniversary with the firm. For *The Big Moment* in the life of Sun's youthful chieftain, turn to **Page 61.**

☐ **Higher Middle Eastern crude prices** were dictated by practical economics of international oil operations. Turn to **Page 63** for a quick look into what they are.

☐ **Turn the valve and the fire goes out.** That's how some old-timers put out their fires, and a few lived to tell about it. Others tried snuffers, smothering the blaze with steam, and a host of additional techniques before Myron Kinley came along with his explosive method to win international recognition by extinguishing the great Moreni blaze in Roumania. The conclusion of a two-part article on *M. M. Kinley, International Fireman* . . . **Page 63.**

☐ **Interdependence and its responsibilities . . .** the oil and gas industries are classic examples of the trend of our times toward interdependence. But this situation raises some questions of mutual responsibility. Turn to **Page 68** and see what Paul Kayser, president of El Paso Natural Gas Company, has to say about them.

☐ **Efficiency is the key to meeting competition . . .** and the oil industry is finding an increasingly important way of promoting efficiency by using automatic controls. While a big advantage is the reduction of costs there are also other benefits derived from automatic controls—promotion of safety, perfection of quality, faster operations and stimulation of production and reduction of waste. A big increase in the next few years in the use of automatic controls is predicted. *The Changing Panorama.* **Page 76.**

☐ **Continued high rate of supply** is seriously threatening the industry's economic position. Recent refining, producing and imports rates have been excessive and if maintained soon will create excessive stocks. Especially disturbing is the refined products outlook. High refining levels are resulting in the production of too much gasoline and distillate. Demand this year has exceeded expectations. This has helped. But the situation now calls for caution. See *Report from the Observatory,* **Page 80.**

☐ **Oil industry price problems** put before Congressional committee . . . Pipe lines reflect the growing demand for oil produced and refined in the Rocky Mountain region . . . What is the effect of the price increase on markets? . . . Tidelands exploration in U. S. moves cautiously . . . New conservation laws needed in Western states . . . European refineries experiencing growing pains . . . The wage picture. It's all in *News Analysis,* **Page 84.**

EXPLORATION ARTICLES

☐ **The advantages are simple.** For various reasons seismologists are still using a variety of seismic computing methods which produce, in some cases, radically different results from the same raw data. Here's an article that describes one method which has the advantages of being simple, fast to use and of allowing the use of any desired velocity function and permitting rapid change from one velocity curve to another. See **Page 93.**

☐ **A new oil province . . .** Northwestern Florida? Discovery of the Pollard pool in Alabama makes the area attractive.

- Here are the reasons.
- Factors relating to development.
- Causes and remedies of difficulties encountered.
- The role of the independent operator in future development—**Page 99.**

DRILLING ARTICLES

☐ **How to pick the correct sling for your job.** Regardless of the type of wire rope sling used in loading or winching drilling equipment, the most efficient sling length and diameter should be used. Here's an article that tells you how to determine the safest load capacities for a given sling and the angle at which they should be used. **Page 121.**

A QUICK LOOK . . .

☐ **Bulk mud saves valuable crew time . . .** and reduces mud waste. Where it is available, it will provide big savings. Its major distribution is in a narrow strip along the Gulf Coast of Texas and Louisiana. The development of the air activation gravity system has made it available for bulk dealers. For story and pictures, turn to **Page 126.**

☐ **How's your control?** Drilling contractors can make or lose money by the manner in which they practice materials control. Drilling equipment is a big investment. The owner should know of its whereabouts at all times. This is possible through an efficient materials control program. An expert in the field tells how to set one up . . . **Page 128.**

☐ **A kinked sand line** can result from careless spooling. This month's WORLD OIL Graphics shows pictorially how an adjustable guide bar with evenly spaced guide pins provides leverage and enables the driller to guide line on evenly. **Page 134.**

☐ **Cheaper drilling is possible** by two means in slanting formations . . . (1) increase the weight on the bit and deliberate drilling of more inclined holes and (2) use larger drill collars which allows carrying of more weight on the bit, without increasing hole inclination. See the second part of *How to Cut Costs in Crooked Hole Areas.* **Page 136.**

☐ **They're solving drilling problems in Saudi-Arabia by**

- Using a floating cap to prevent lost circulation.
- Running and cementing five strings of casing.

For a discussion of the problems encountered and the methods used to combat them, see **Page 146.**

☐ **Mounting spare tires on heavy-duty trucks** was a problem for one company until they came up with the idea of putting a tire on the side of the truck instead of behind the truck's cab. A risky job that once took two men can now be handled easily by one man. For "how to do it," see **Page 152.**

PRODUCTION ARTICLES

☐ **How condensate was increased** on an East Texas lease . . . liquid reserves of gas distillate reservoirs can be increased by improving the recovery of condensate from the produced gases. Advancements made over conventional low-temperature separation methods include glycol injection coupled with stabilization to increase recovery by 22.4 percent. Tests performed under field conditions show rapid payout of additional equipment investment. Results and hookup data are given. Turn to **Page 176.**

Recognize this?

☐ There is no resemblance between the hookup above and a drilling rig . . . but this is a typical wellhead assembly for a wire line workover. Described here for the first time in print is a new wireline technique for working over wells at half the normal cost. Wells can be squeeze cemented and perforated under perfect control without the use of a drilling rig. Hundreds of wells are now equipped to take advantage of this less expensive workover method. And a considerable number of successful workovers have been made on a variety of wells, including gas lift wells . . . it's all in an article starting on **Page 165.**

☐ **Use of compressed gas in acidizing treatment** of gas wells has cut costs by as much as $1100 in the Carthage field of East Texas. The gas serves as a flushing medium behind the acid to eliminate possible contamination of the formation. It gives no hydrostatic head so wells clean out with no swabbing required. For more information on how it's done, see **Page 180.**

☐ **How to test quality of injection water . . .** Plugging characteristics of injection waters can be determined long before an injection system has been designed for water disposal or water-flooding. A simple laboratory test which utilizes only a few pieces of

Turn the Page

A Quick Look . . .

lab equipment will determine how badly the formation will be plugged by the water. Such tests are useful in learning how much filtration is required . . . or they will indicate the efficiency of existing filtering equipment. Turn to **Page 189.**

☐ **Hydraulic fracturing Mississippian sandstones** in the Illinois Basin is paying off. Its success has brought about new drilling in areas once considered non-commercial. Abandoned wells in low permeable sandstones have been recompleted as commercial producers. Results of treatment are discussed, data given on fracturing trend in tri-state area by formations in an article starting on **Page 192.**

☐ **A flexible flow line manifold . . .** some helpful hints on how to install it. Here's a manifold that handles relatively high-pressure wells on a lease that also has low-pressure wells. For more about this and other ideas turn to Production Hints, **Page 201.**

PIPE LINE ARTICLES

☐ **Evaporation in storage tanks cut 80-90 percent.** That's the record made by a new foam product in recent tests. The "fluid" is made up of millions of hollow, balloon-like phenolic resin spheres containing sealed-in gas. When dumped in sufficient quantities on the surface crude or products in a storage tank, they spread into an inch-thick blanket over the surface and virtually eliminate evaporation. The savings promised are tremendous. See **Page 211.**

☐ **The Map of the Month** in this issue is on Columbia Gas System, Inc., a company which is now in the seventh year of an expansion program with expenditures for 1953 expected to total $67 million. Columbia has spent an average of $48 million annually in the postwar period on new facilities. **Page 214.**

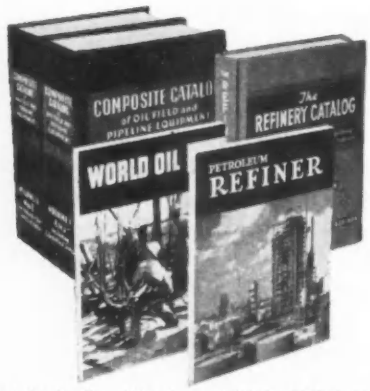
INTERNATIONAL ARTICLES

☐ **The big payoff . . .** American Independent Oil Company's Neutral Zone discovery came recently after five dry holes and expenditures of $30 million. Producer is first made in the Middle East by a U. S. company other than the "Big Five." Pictures and story, **Page 229.**

☐ **A silk-stocking oil region . . .** Nottinghamshire County, England, owes its stature about as much to hosiery as to oil. But back in 1939, when crude was discovered, oil temporarily ousted the usually-placid Britons from their serenity. Another *Kingdoms of Oil* starts on **Page 230.**

☐ **Communism must have its scapegoats . . .** and Roumanian Communists, guilty of ineptitude and of establishing unrealistic petroleum quotas, have shifted the blame to 24 former oil industry officials. The result—long prison terms for most. **Page 234.**

☐ **Exploration permits are available** in Turkey to all qualified oil companies even though the new petroleum law now being drafted has not been approved . . . An Argentine wildcat has found oil at 13,400 feet . . . Retail prices on gasoline, fuel oil, kerosine and heating oil have been reduced 25 percent in Russia . . . Drilling activity reported in Czechoslovakia. These and other news items from *a WORLD of OIL*, **Page 236.**



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Indexed by Industrial Arts Index and Engineering Index

Looking Ahead . . .

. . . **Better supply of oil country tubular goods** and other steel supplies is promised several months from now as a result of June advance in steel prices. Higher prices should stimulate mill production of scarce goods, including pipe. However, demand for tubular goods also may increase beyond earlier expectations as a consequence of the June increase of about 25 cents in crude prices east of California.

. . . **Gas industry now is roughly ¼ of the petroleum industry's size,** rated by investment and capital expenditures. Petroleum this year will make capital expenditures of $4 billion in U. S. and then will have gross investment in U. S. of $44 billion. Gas utility and pipe line industry will spend $4 billion in next four years for new facilities and expansion. It spent $4.7 billion similarly in four years 1949-1952. (See Page 58.)

. . . **North Dakota's first crude oil pipe line** will be completed in late November. It will move crude from Tioga and Beaver Lodge fields to 30,000-barrels-per-day refinery that Standard Oil Company (Indiana) is building at Mandan, N. Dak. Owned by Service Pipe Line Company, line will include 65 miles of 12-inch pipe from Tioga to Kildeer and 105 miles of 16-inch thence to Mandan. It will have initial capacity of 35,000 barrels daily and ultimate capacity of 100,000 daily by adding pump stations. Service currently gathers crude in Tioga and Beaver Lodge fields for rail shipment from tank car loading rack at Tioga.

. . . **Electricity may offer competition to oil, gas, and coal** for heating purposes by use in all-year air conditioning. Bureau of Mines has published report describing use since 1947 of a heat pump for air conditioning a home, winter and summer, at McLean, Va. In summer, system picks up heat from house with a refrigerant and removes it with water or air. In winter, flow of refrigerant is reversed, and system takes heat from water or air and transfers it to house. Only one-third of heat is derived from the electricity used to power the system, providing most efficient method of domestic heating with electricity.

. . . **Whether Iranian oil would be affected** by President Eisenhower's recent letter to Iranian Prime Minister Mossadegh is conjectural. Eisenhower said U. S. would not extend more economic aid to Iran, as fair settlement of oil nationalization would make Iran's oil a source of large revenue. He further said U. S. government would not purchase Iranian oil at present, with ownership not settled. Eisenhower added that compensation merely for losses of physical assets could not be called a reasonable settlement.

. . . **Completion of new $10 million refinery near Vancouver** has been set for end of 1954. Refinery is being built by Standard Oil Company of British Columbia, subsidiary of Standard of California. New plant will be adjacent to company's present refinery at Burnaby. It will process 11,000 barrels daily of Alberta crude, brought in by Trans Mountain Pipe Line Company's crude line, now being built.

. . . **FPC approval of a $175 million project,** including 1058 miles of pipe line to increase gas supply to California, Arizona, New Mexico and Texas consumers, has been granted El Paso Natural Gas Company. Expansion would raise capacity of El Paso's system from 1.5 to 1.9 billion cubic feet daily, of which 1.4 billion would go to California.

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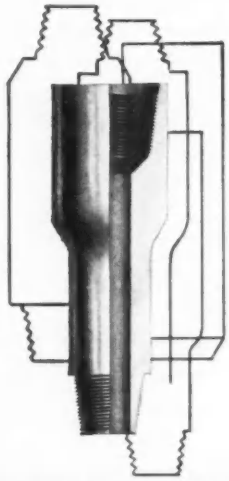

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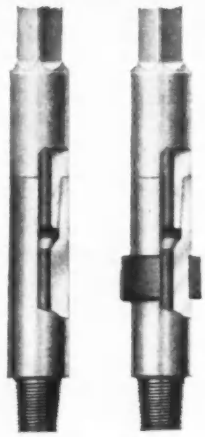

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Picking On Oil Again

Practically everything has increased appreciably in price during the past five years. The petroleum industry was one of the last commodities to boost its prices.

During June, oil experienced its first general price advance since December, 1947. Crude prices rose an average of 25 cents per barrel. This smallish increase represented only a 10 percent boost, and was not sufficient to cover advances in operating costs during the past five years.

Gasoline prices in some areas rose two cents per gallon, but generally the increase amounted to only one cent per gallon. Thus, higher retail prices will boost what the average U. S. motorist spends for motor fuel by less than $10 per year. Retail gasoline prices today are only three cents per gallon higher than in 1948, and higher taxes account for a third of this increase.

•

A big fuss is being raised over these advances in oil prices. A Congressional committee is investigating the whole industry. Suggested remedies range all the way up the scale to absolute federal government control.

Members of the investigating committee have made no bones about being hostile to the industry. Instead of sticking to the purported purpose of seeking facts, too many of the committee members are using the investigation to publicly express personal preconceived ideas. It seems obvious that the facts being uncovered are not changing the opinions of these members. They are politicians playing politics rather than exercising their responsibility to the nation.

•

Why investigate higher oil prices? Most other industries advanced their prices several times and to a larger degree during the five years since oil prices increased. How come committee members charge a monopoly in production of oil because all companies advanced prices the same amount at the same time?

What about cigarettes, milk, bread and hundreds of other commodities? Like gasoline, some of these may vary slightly in price in different localities, but also like crude oil and gasoline all companies usually increase or reduce their prices the same amount at the same time. The same economic factors face all companies engaged in any industry. Free competition forces each company to stay in line with average industry prices. No company can cut or increase prices without expecting competitors to follow suit.

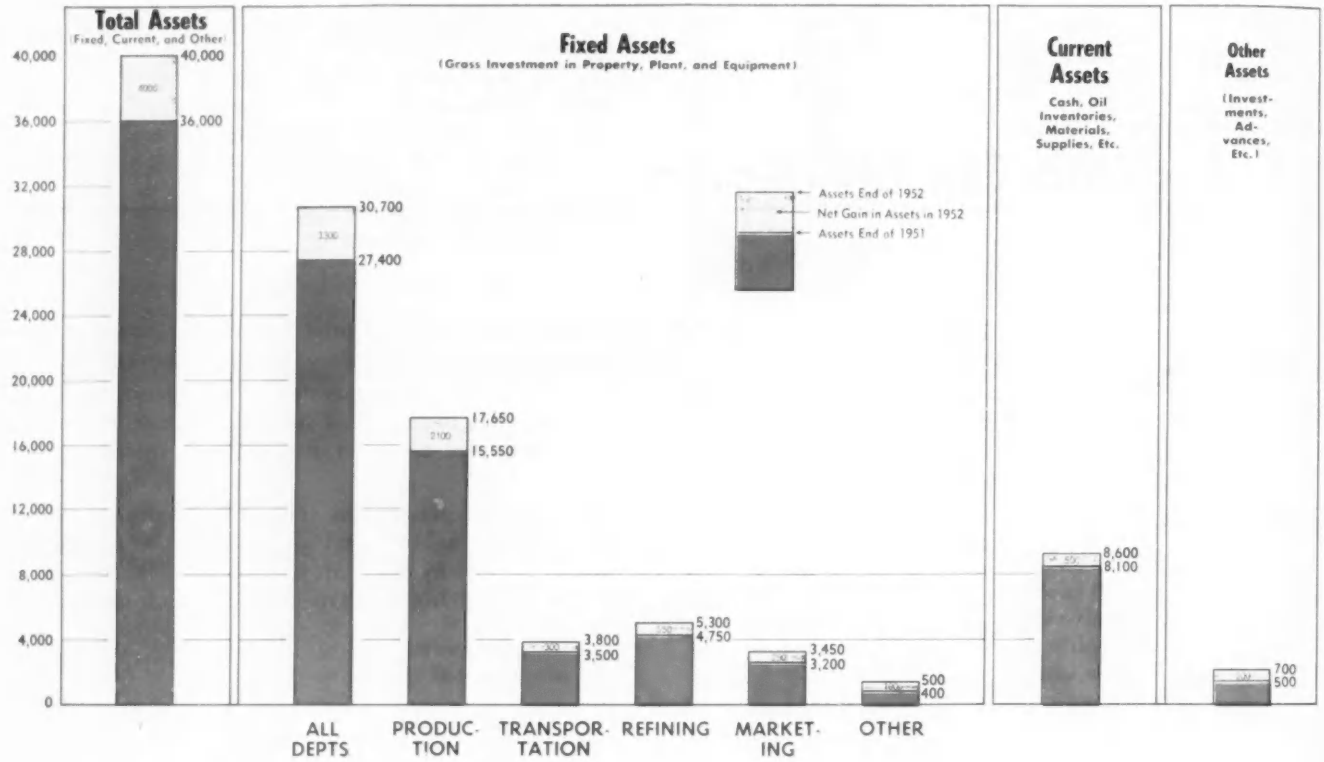
The oil industry is being "picked" on again. This has an old familiar ring. It has happened many times before. The industry has been investigated and reinvestigated time and time again. Little if anything has come from the many previous Congressional investigations, and the present one is not likely to be any different.

However, the present investigation serves to warn the industry that it is still considered a favored scapegoat by politicians. When Congress will not give the industry a fair hearing, oil's only recourse is to engage in a bigger and better public relations program for the education of the non-oil people of this country.

Warren L. Baker

• Assets Employed (or Investment) in U. S. Oil Industry

. . . at end of 1951 and 1952 and in millions of dollars



Oil to Be $44 Billion Industry This Year

Assets already past $42 billion mark. Business is now fourth largest in the nation from standpoint of investment.

By L. J. LOGAN, WORLD OIL Staff

THE PETROLEUM industry will have by the end of 1953 a total gross investment of approximately $44 billion in the U. S. This follows record breaking capital expenditures of more than $4 billion during 1953.

At this time, the assets employed in the U. S. petroleum industry exceed $42 billion. This makes petroleum the nation's fourth largest industry from the standpoint of investment.

Agriculture employs an investment of $170 billion, the railroads about $60 billion, and the public utilities approximately $52 billion.

The U. S. petroleum industry now has twice as great an investment as at the end of World War II, when it was little more than a $20 billion enterprise. It has three times as much investment as it had 16 years ago. The total gross investment in 1937 was approximately $13,725,000,000, according to the API's *Petroleum Facts and Figures,* Seventh Edition, 1941, page 178.

These increases in the industry's capital investment have reflected the vigorous post-war expansion of facilities in all divisions of the industry. But the increases have been accentuated by the inflated costs of all new facilities installed during and since the war.

It is estimated that the industry will make capital expenditures in the U. S. in excess of $4 billion during 1953. This will be a new record, somewhat exceeding the $3.8 billion spent for property, plant, and equipment in the U. S. in 1952, as reported recently by Frederick G. Coqueron of the Chase National Bank in the pamphlet, "Financial Analysis of 30 Oil Companies for 1952." (See Table 1.) Expansion was retarded in 1952 by the

steel strike and scarcities of materials and equipment. Drilling was curtailed by the pipe shortages, and work was slowed down on refinery and pipe line construction.

Of the $3.8 billion capital expenditures by the petroleum industry in the U. S. in 1952, $2.6 billion, or 68.4 percent, was spent in the production department, for oil leases, wells, and equipment, natural gasoline plants, and natural gas producing and other gas facilities of oil companies. Outlays in the transportation department totaled $400 million, or 10.5 percent of the total, with $275 million spent for new crude oil pipe lines, $60 million for product pipe lines, $50 million for tankers and marine equipment, and $15 million for tank cars and motor trucks. Capital expenditures of $470 million in the Refining department represented 12.4 percent of the industry total. Marketing department expenditures of $280 million were 7.4 percent of the total. Other sums of $50 million were 1.3 percent of the total capital expenditures.

The natural gas industry also continues its vigorous post-war expansion. Construction expenditures will total $3.6 billion for the four years, 1953-1956, an average of almost $1 billion annually, the American Gas Association has forecast. (See Table 3.) Actual expenditures for construction of natural gas pipe line facilities for the four years 1949-1952 totaled $4.3 billion, the AGA survey showed. The estimated expenditures of $1,291,000,000 for 1953 compare with $976 million actually spent in 1952. These figures include transmission, production, storage and distribution facilities.

—THE END

ACKNOWLEDGMENT

The chart on the preceding page compiled from Chase National Bank bulletin, "Financial Analysis of 30 Oil Companies for 1952."

TABLE 1

Property, Plant, and Equipment of U. S. Petroleum Industry

(Source: Chase National Bank bulletin, "Financial Analysis of 30 Oil Companies for 1952.")

	Estimated Expenditures for Property, Plant, and Equipment in Years 1946-1952										Estimated Investment Dec. 31, 1952, in Property, Plant, and Equipment			
	Million Dollars						1952		7 Yrs. 1946-52		Gross		Net	
DEPARTMENT	1946	1947	1948	1949	1950	1951	$ Million	% of Total	$ Million	% of Total	$ Million	% of Total	$ Million	% of Total
Production Dept.	**1,100**	**1,425**	**1,700**	**1,650**	**1,675**	**2,125**	**2,600**	**68.4**	**12,275**	**63.8**	**17,650**	**57.5**	**8,325**	**54.1**
*Oil Leases, Wells, Equipment	1,050	1,325	1,550	1,450	1,500	1,975	2,450	64.4	11,300	58.7	16,500	53.7	7,600	49.4
Natural Gasoline Plants	35	50	100	110	75	75	75	2.0	520	2.7	675	2.2	400	2.6
*† Natural Gas	15	50	50	90	100	75	75	2.0	455	2.4	475	1.6	325	2.1
Transportation Dept.	**170**	**310**	**325**	**270**	**175**	**300**	**400**	**10.5**	**2,000**	**10.4**	**3,800**	**12.4**	**2,100**	**13.6**
Crude Oil Pipe Lines	75	130	180	150	125	175	275	7.2	1,135	5.9	1,950	6.4	1,075	7.0
Product Pipe Lines	30	40	30	25	25	75	60	1.6	310	1.6	475	1.5	325	2.1
Marine	60	125	100	75	15	35	50	1.3	460	2.4	1,025	3.3	550	3.5
Tank Cars; Motor Trucks	5	15	15	20	10	15	15	0.4	95	0.5	350	1.2	150	1.0
Refining Dept.	**250**	**400**	**600**	**420**	**275**	**325**	**470**	**12.4**	**2,740**	**14.2**	**5,300**	**17.3**	**2,600**	**16.9**
Marketing Dept.	**200**	**300**	**225**	**240**	**275**	**300**	**280**	**7.4**	**1,820**	**9.4**	**3,450**	**11.2**	**2,075**	**13.5**
Others	**30**	**65**	**100**	**70**	**50**	**50**	**50**	**1.3**	**415**	**2.2**	**500**	**1.6**	**300**	**1.9**
Total, All Depts.	**1,750**	**2,500**	**2,950**	**2,650**	**2,450**	**3,100**	**3,800**	**100.0**	**19,250**	**100.0**	**30,700**	**100.0**	**15,400**	**100.0**

* Expenditures include cost of drilling dry holes. † Includes only natural gas producing, transmission, and distribution facilities of oil companies.

TABLE 2

Estimated Assets Employed (or Investment) in U. S. Petroleum Industry, December 31, 1952

(Source: Chase National Bank bulletin, "Financial Analysis of 30 Oil Companies for 1952.")

	NET ASSETS		GROSS ASSETS	
ITEM	$ Million	Percent of Total	$ Million	Percent of Total
Current Assets	8,600	34.8	8,600	21.5
Investments and Advances	200	0.8	200	0.5
Property, Plant, and Equipment	15,400	62.4	30,700	76.7
Other Assets	500	2.0	500	1.3
TOTAL	24,700	100.0	40,000	100.0

TABLE 3

Gas Utility and Pipe Line Construction Expenditures, by Type of Gas and by Plant Function, 1952-1956

Source: American Gas Association

(Millions of Barrels)

Type of Gas and Plant Function	Actual 1952	FORECAST 1953	1954	1955	1956	Total Forecast 1953-1956	Actual Total 1949-1952
Natural Gas, Total	**976**	**1,291**	**967**	**688**	**662**	**3,608**	**4,283**
Production	111	142	55	43	41	281	517
Transmission	493	802	528	295	293	1,918	2,641
Underground Storage	43	38	54	27	15	134	*
Other Storage	1	1	2	3	1	7	*
Distribution	286	269	304	295	289	1,157	976
General	42	39	24	25	23	111	149
All Other Types of Gas, Total	**91**	**118**	**90**	**82**	**79**	**369**	**403**
Production and Storage	20	28	20	18	21	87	113
Transmission	3	8	4	4	3	19	18
Distribution	63	78	60	56	52	246	250
General	5	4	6	4	3	17	22
Total Industry, Total	**1,067**	**1,409**	**1,057**	**770**	**741**	**3,977**	**4,686**
Production and Other Storage	132	171	77	64	63	375	630
Transmission	496	810	532	299	296	1,937	2,659
Underground Storage	43	38	54	27	15	134	*
Distribution	349	347	364	351	341	1,403	1,226
General	47	43	30	29	26	128	171

* Included in production.

How much authority should safety directors have?

Very Little, they say

By AL REESE, WORLD OIL Staff

How much authority does a safety director need to do his job?

"Not much," declared industry safety experts in reply to a WORLD OIL questionnaire.

Should a safety engineer have the authority to penalize a worker for persistent infractions of the rules?

"Absolutely not!"

Then should he have the authority to recommend punishment?

"Yes," they said—though not so emphatically. And they were even less emphatic when asked: *Should a safety director have the authority to stop unsafe job procedures or to shut down a unit being operated in violation of the safety rules?*

Only 32.5 percent said "No," whereas 22.5 percent said "Yes, in emergencies," and 45 percent said "Yes" without any qualification.

Forty safety men cooperated in the survey, of which 12 are connected with drilling contractors or companies principally engaged in drilling. The remaining 28 are in the employ of firms concerned wholly or in part with other phases of the industry.

Despite the differing nature of the employes, working conditions and management structure of the companies with whom the two groups of safety directors work, the survey revealed little difference in their opinions according to classification except in the matter of direct authority over personnel. When asked whether a safety man should have the authority to penalize a worker for persistent infractions of the rules, two of the 12 participants wholly concerned with drilling said "Yes," whereas all 28 in the other category returned a ringing "No!" Moreover, 11 drilling men said they ought to have the authority to recommend punishment in such instances, while only one thought they should not have this power. By contrast, 21 of the other group said they should have the authority to recommend punishment, whereas seven said they should not.

One of the 2-in-40 who said safety men should have the right to penalize a worker put it this way: "The safety director working in a staff capacity is a nice-sounding theory, but he needs prestige and authority for exactly the same reason that a policeman needs to wear a gun."

Said the other dissenter: "A safety director should have . . . complete authority to make a safety program work."

Several others in the drilling branch half-agreed with this. Said one: "Safety directors should recommend dismissals, demotions, etc., and those recommendations should be respected and heeded—not ignored. A safety director doesn't need unlimited authority, but he does need the respect and backing of management."

Said another: "I believe the safety director should have more to say as to policy and the complete program."

A Selling Job. But the survey indicated that the opinions of most drilling men are more in accord with these:

- "Safety is a selling job, not one of penalties and punishment . . . The taking of too much authority by some safety directors has given the profession a bad name."

- ". . . safety directors should spend more time directing safety and less time compiling records and statistics, meeting with other safety directors, and worrying about authority."

- "Is the safety director a line supervisor? God forbid. His job is bad enough without having the odium of ordering people to do this or that."

One rebel went even further: ". . . the safety director has no authority."

One of the most outspoken participants in the survey is with a company concerned with drilling and producing. "A safety engineer," he said, "is a staff man and should not have any authority to fire, stop jobs, etc., without going through regular channels. The good safety engineer gets things accomplished through having the respect of management and employes alike. If the word gets out that he can get a man fired, then the employes and the lower echelon of management will not call things to his attention that he needs to know about.

"In my opinion the most terrible thing that could happen to the average safety engineer would be for him to get too much authority. In most instances . . . the safety engineer would start being about as ineffective as most police departments are in obliterating crime.

"In my opinion the really effective, or the most effective, safety engineers in the oil fields today are the ones that work like hell out in the field instead of sitting on their *(editor's deletion)* in an office fretting because they don't have the authority to do anything.

"Again . . . the safety engineer's authority is derived from absolute respect from the pumper to the president."

This opinion is representative of those surveyed who are not primarily concerned with drilling—but with one point excepted. That is the matter of whether a safety engineer should have the authority to shut down a unit be-

ing operated in violation of the rules. Ten thought they should have this authority, 10 said not, and 8 said only in emergencies. By contrast, eight of the 12 drilling men thought they should have this authority.

Free Communication. The differences in the executive organization of the various companies prevented a clear-cut analysis of opinion on the matter of to whom a safety engineer should report. However, most thought there should be free communication with an executive who has the authority and inclination to act decisively and promptly. "The line of communications," said one, "should be as direct as possible with management in order to (a) impress and demonstrate management's interest in the safety of the personnel; (b) to keep management well informed on matters of fire and safety; and (c) to lend the same prestige to the Fire and Safety department as to other operating and maintenance departments."

Another declared that "The safety director should report to the official heading the staff branch of the organization. If staff and line are headed by one individual, safety should report to him, regardless of title."

"I like safety to be part of the Industrial Relations department," declared another, "but it can be effective under any top executive except the Engineering department."

One participant said safety should not be connected with industrial relations. "No safety director or safety engineer should report to the industrial relations supervisor. Settling labor disputes with one hand and selling safety with the other won't get the job done."

Ten of the drilling men, who by and large work with comparatively smaller companies, said they should report to the very top man in the organization, and two said they should report to the top line man in the area. In the other classification, 5 said they should report to the top man, 3 said to the industrial relations chief, 9 said to the top line man in the area, 10 thought that anybody at the executive level is satisfactory, and 1 said it is unimportant, just so management is interested in safety.

The survey contained one other question: *Should the fire and safety directors' jobs be combined in the interests of centralized authority?*

"Yes," said nine of the drilling men and 20 of the others. Two thought not, 7 said not necessarily, and 2 said only in small plants.

"Fire prevention and safety of personnel," one declared, "are synonymous to the preservation of life and property; therefore, the duties of the safety director should combine all activities necessary to accomplish these purposes. Much duplication can be eliminated by a single administration of fire and safety responsibility."

But another replied: "Fires are accidents, so why not incorporate fire protection training in the accident prevention program? The safety director should not be placed in charge of fire-fighting. This is a line supervisor's job." —**THE END**

The Big Moment

for ROBERT G. DUNLOP

THE 20TH anniversary of Robert G. Dunlop's association with Sun Oil Company was recently commemorated with the presentation of a service pin to the youthful president.

The occasion coincided approximately with the 20th anniversary of the saddest holiday of the sad year of 1933—the bank holiday. These two apparently unrelated events bracket The Big Moment in the career of Bob Dunlop.

Robert G. Dunlop

When Franklin D. Roosevelt closed the banks Dunlop was with a Philadelphia certified public accounting firm that depended heavily at that time of the year on the banks' business. It became imperative to reduce the staff, and Dunlop was a comparatively new man. They laid him off for six months.

Within a week Dunlop fortunately had a job—a temporary job with Sun Oil that became permanent three months later when he informed his boss that his former employer had invited him back to work.

Dunlop's desk in Sun's accounting division was a vantage point from which he viewed the company's entire producing, refining and marketing operations. Moreover, during his early years with the firm his responsibilities were not limited to any one department. His was the opportunity for full development, the privilege of being unencumbered when there was a specific job to be done.

His first big opportunity came in the guise of a pestilence of paper work created along with NRA. He wrote a highly useful analysis of his company's operations in the light of new requirements inflicted by the NRA Petroleum Code.

This work also familiarized him with the activities of the industry as a whole. President J. Howard Pew remembered this in 1939 when the need arose to prepare testimony to be presented before the Temporary National Economic Committee on behalf of the oil industry. Dunlop spent six weeks in Washington, again enjoying the opportunity of an exposure to the industry's broad problems.

Two years later he was appointed assistant comptroller of Sun. When his appointment as comptroller was announced in December, 1943, it was about the first time anyone around the company's offices had ever heard the 34-year-old Dunlop called anything except "Bob." In March, 1947, J. Howard Pew retired and he became president of the company.

Middle East Prices Up . . . Why?

- **Most companies operating there are also major U. S. producers.**
- **The countries own half interest in their petroleum production.**

By ROBERT E. SPANN, WORLD OIL Staff

ECONOMICS DICTATED the spread of higher crude prices to the Middle East. It was not the economics of supply and demand, however, but the practical economics of international petroleum operations.

It involves two considerations. One is that with the exception of Anglo-Iranian Oil Company, Ltd., the parent companies that produce Middle East petroleum also are major producers in the U. S., where the price increase for crude averaging 25 cents a barrel became effective in mid-June, and in Venezuela, where similar postings were made eight days later. Without an increase in the Middle East, now a substantial exporter to the U. S., producers there in effect would be underselling their own production and markets in the Western Hemisphere.

Seven major oil companies—Standard Oil Company (N. J.), Royal Dutch-Shell Group, Gulf Oil Corporation, The Texas Company, Standard Oil Company of California, Anglo-Iranian and Socony-Vacuum Oil Company, Inc. (listed in order of rank)—control almost all of the Middle East oil output.

The more important consideration, and probably the more practical one, is that all Middle East countries have a 50 percent interest in their petroleum production, i.e., the price received for their oil. It was obvious that these governments would not ignore price increases for crude in the Western Hemisphere made by affiliated companies of their producing concessionaires.

Significance of the spread of higher crude petroleum prices to the Middle East is two-fold.

- By restoring the price relationships that existed prior to the 25 cents a barrel increase in the U. S., a firmer support has been placed under the prices U. S. domestic producers receive for their crude.
- Similarly, it bolsters the position of Venezuela, the largest individual petroleum exporting nation.

With the higher postings, and the great benefit to the Middle East of presently reduced ocean tanker rates, crude from the area still can be delivered to the U. S. East Coast at a 23 cents per barrel price advantage over Venezuelan crude of similar quality and 22 cents a barrel (including duty) below the delivered costs of West Texas crude to the New York-Philadelphia area.

To understand why Middle East oil prices are of such great significance to both U. S. and Venezuelan producers is easy. Current production from the Persian Gulf area amounts to 18 percent of the world total, compared with just under 16 percent in 1952, and the region as an exporting unit is the largest supplier of oil in international commerce.

Middle East oil also is making steady inroads in Venezuela's Western Hemisphere markets. Middle East oil was first imported into the U. S., Venezuela's most important petroleum customer, in 1946 at a trickle of 400 barrels daily. Last year, the Middle East volume averaged 154,000 barrels daily, and in mid-1953 the rate had increased to 228,500 barrels daily of the U. S. total crude imports of 628,000 barrels per day.

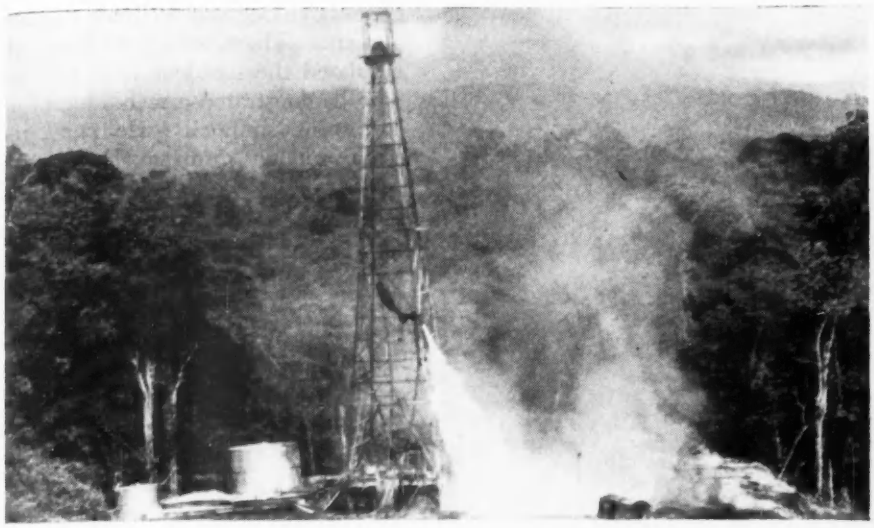
In face of the trend of world petroleum supply increasing at a faster rate than demand (excess of daily supply over demand in 1952: 291,300 barrels) the logical question is raised as to what assurances are there that Middle East prices can be expected to remain firm, thus assuring some foundation of stability of prices in other major producing areas—the U. S. and Venezuela.

While undoubtedly there is strong competition among major world petroleum marketing organizations, whose operations have a direct influence on crude prices, and a continued dollar shortage in the Eastern Hemisphere countries that consume Middle East petroleum, these factors are offset by:

- The partnerships that own Middle East production—the producing companies and the governments or individual rulers of those countries. Price reductions must have at least indirect government approval and such is not easily obtained.
- The large volume of Middle East oil that can be sold in the sterling area for soft currencies and the trend of American producers and sellers to "sterlingize" their operations, reducing dollars requirements from European sales. Compilations of the Mutual Security Agency show that in 1952 the dollar element in American oil companies sales to the European Payments Union and other countries in the sterling area accounted for only 45 percent of the total wholesale value of the oil supplied.

Some of this dollar element in dollar-produced Middle East oil was further offset by the dollar content of sterling produced Middle East oil. This latter represents the necessary equipment that must be bought in dollar areas and the requirements of the sterling producers to pay certain percentages of royalties and taxes in gold (and/or dollars).

Previously, this year oversupply of petroleum, a condition which still exists, brought reductions of 15 cents a barrel in the prices posted by Anglo-Iranian and Gulf for Kuwait crude. With this reduction, Kuwait crude had a price advantage over all other Persian Gulf crudes and it was in effect for more than three months before Gulf initiated the 25 cents a barrel increase in the Middle East on July 10. The action was not followed by other Middle East producers due primarily to the concern over the repercussions such actions might have with the various governments.



Well afire in Venezuela . . .

. . . going . . . going . . .

. . . gone!

Kinley was here.

Some said he needed the aid of a king to tackle the great Moreni fire and the assistance of heaven to put it out . . . Anyway, the job won wide recognition for . . .

M. M. Kinley, International Fireman

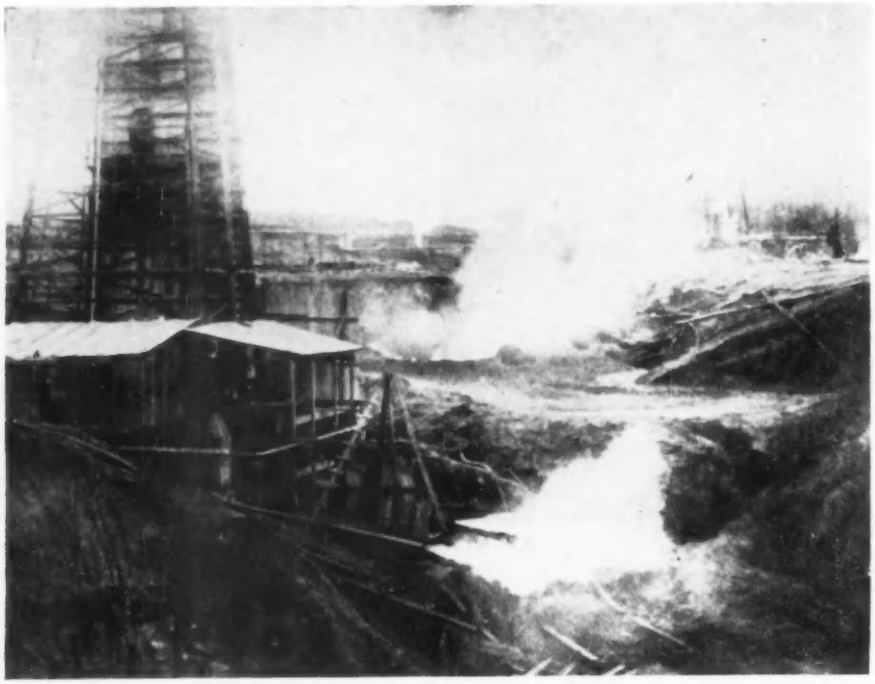
By AL REESE, WORLD OIL Staff

EDITOR'S NOTE: *In the opening chapter of the story of Myron Kinley were detailed some of the techniques he has used in extinguishing famous fires. This, the concluding installment, describes his early struggles for recognition of his explosive method and describes some of the competing techniques used in the early days.*

THE JOB THAT brought international recognition to Myron Kinley was undertaken by order of a king and accomplished with the assistance of heaven.

Part 2

This approximates the epitaph raised by Roumanian newspapers over the charred grave of history's most publicized oil well fire—the "permanent" blaze in the Moreni field, conquered by Kinley after a siege of 189 days during which he was defied by nature, nagged by officials, hobbled by government rulings, and frustrated by



THE GREAT MORENI FIRE . . . looking past an unsuccessful relief well.

ignorance and prejudice.

Elsewhere, Kinley was given a larger share of the credit. Business picked up, though very gradually in the face of two lingering obstacles. One was the hard-dying practice of most companies to fight their own fires. Despite the operators' liability for men injured and the tremendous financial losses incurred with each hour that amateurs dawdled at the job, there was a reluctance to call in professionals.

As late as 1931 an editorial in a trade publication wondered at this circumstance. It was observed that such specialists as the rig builder, the drilling contractor, the cementer and the shooter were institutions in the industry, but the professional fire-fighter had not been accepted. The writer could give no explanation for this other than that oil men liked to fight fires just for the hell of it.

The other obstacle was that Kinley's dynamite method had a multitude of competing techniques, some of which were almost as old as the industry. Principal among these were the snuffing method, whereby a funnel-shaped contrivance was lowered over the wellhead to extinguish the flame; and the smothering method, in which the blaze was deluged with water or mud, or pounded with steam from a battery of boilers. Except for tunneling and directional drilling, most of the other techniques ranged from fantastic to merely crackpot. One objector to the Kinley method declared that explosives might cause an earthquake and suggested that a "flame subtractor or distractor" be employed to lead the blaze from the well, which could then be capped.

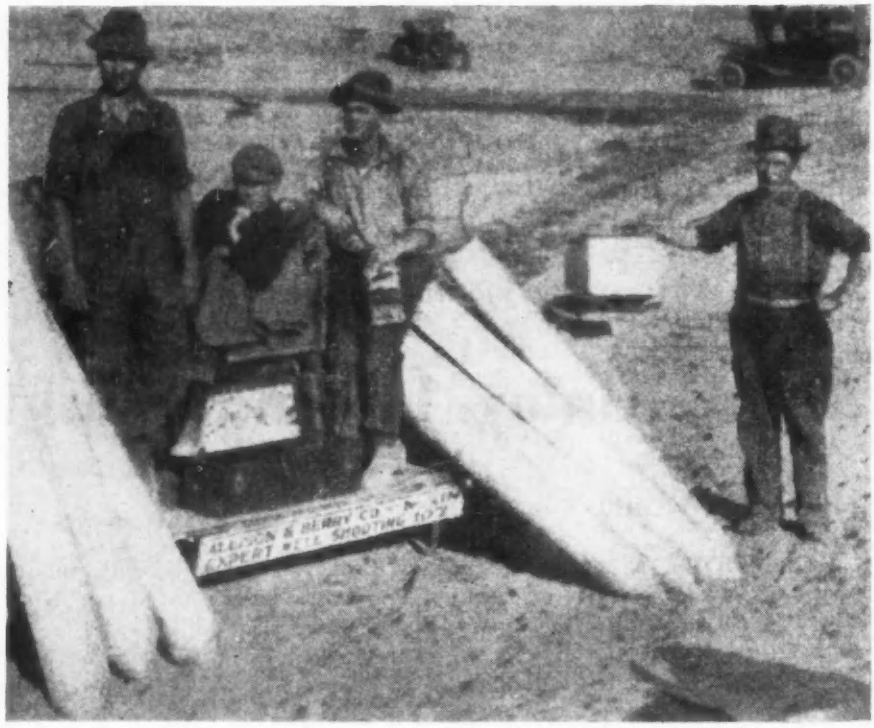
Gillispie Method. Every new idea expounded seemed to find a willing audience. There were even those who emulated the fabulous Burr Gillispie, who demonstrated a technique of unsurpassing simplicity. He put out a fire by merely shutting off the valve.

It happened in Mexico's Amatlan field in 1921. Two wells 200 yards apart came in for 35,000 barrels each. One caught fire from a boiler, and flames spread to the other. Officials made repeated ineffectual attempts to quell the blaze while Burr plucked at their sleeves for an audience. Finally they listened. "In Texas," Burr is supposed to have said, "they put out fires by closing the valves with wrenches." He explained that the updraft caused a comparatively cool spot at the wellmouth, which would allow a man to work without being roasted.

Given permission to try, Gillispie donned heavy clothes and covered his face except for the eyes. He affixed a metal shield to a buggy, put aboard a couple of heavy stillson wrenches, and moved to the wellmouth, spraying the way with a water hose.

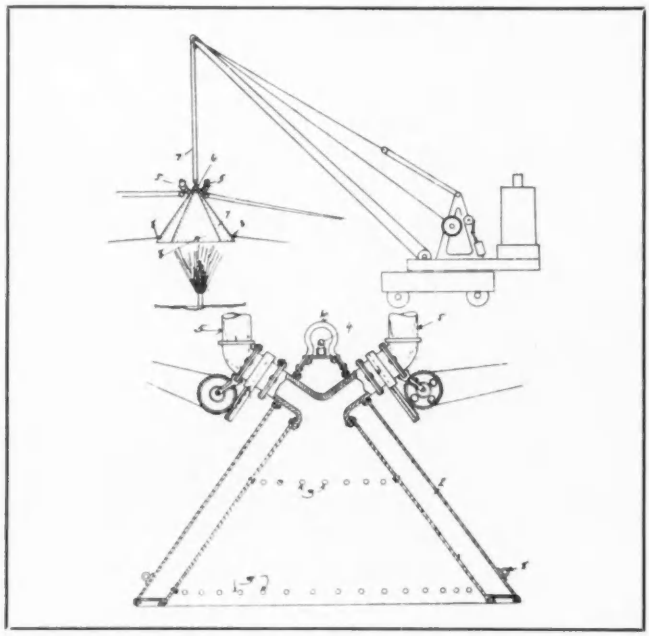
For two hours Burr lay near the casinghead and played water on the valves. Then he took 24 turns with a wrench and the fire was out. The other well was extinguished the same way.

Just how eager the industry was to



From International Petroleum Technology

IN 1913, the year this picture was taken, a drilling crew that included Karl T. Kinley, father of Myron, accidentally stumbled on the method of extinguishing fires with explosives. The boy sitting in the shooter's car is Myron Kinley. His father is at far right.



SNUFFER IN ACTION is shown in top part of drawing. Below is detail of the device.

use any method, however impractical, to extinguish fires is illustrated by the fact that Burr had a host of imitators —and some, astonishingly, were successful. Indeed, a trade publication was moved to warn that the Gillispie method was not sound. Closing the valve might aggravate the situation by spreading flames along the ground, it was explained, and besides, if the fire had been burning for any length of time, the valve would be warped.

More feasible was the snuffing method, which had a multitude of variations. One of the more successful devices was used by E. E. Schock of St. Louis and T. H. Bass of Houston to extinguish a fire in the Smackover, Arkansas, field. In principle, the apparatus consisted of a length of large pipe with an elbow. This was supported in a framework built on rollers and operated on a wooden track, allowing it to be pushed up to the well. The elbow was pulled over the blaze with a block and tackle. A bell nipple aided in the snuffing operation.

Steam Used. A widely practiced technique was to hook 5 to 15 boilers in series to smother the blaze with simultaneous blasts of steam.

Sometimes both the snuffing and smothering processes were used, and at one famous fire this combination succeeded after explosives failed.

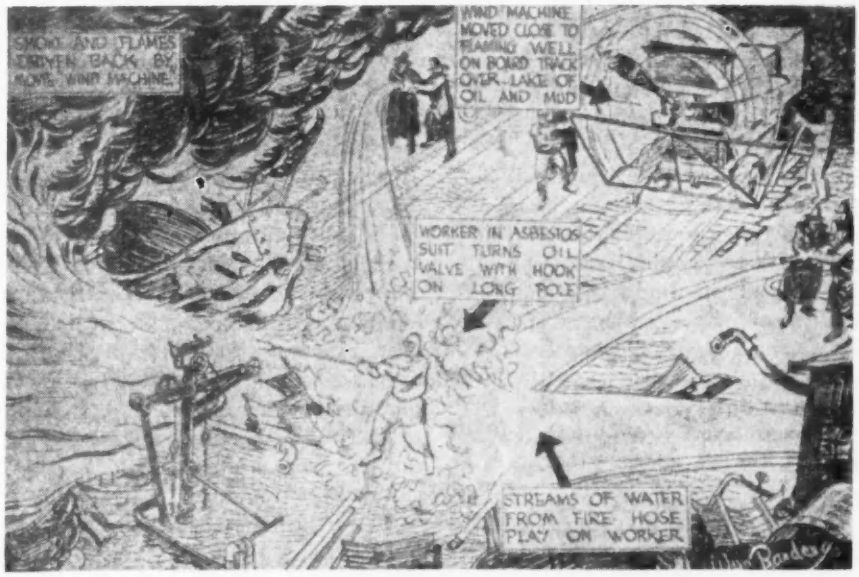
This blaze was at the W. J. McKie well in the Corsicana, Texas, field in May, 1923. It came in for 3000 barrels from 2960 feet, soaking the crew with oil. A hammer struck a spark from the control head and it caught fire, killing 14. Steam from 12 boilers having failed to put out the blaze, a 12-pound charge of dynamite was set off while a wall of steam simultaneously assailed the fire. The charge was too light (Kinley has used as much as 500 pounds of dynamite at a shot) and the explosion only caused a momentary gap in the flames.

Next day an attempt was made to snuff the well, but the heat melted the nipple on the snuffer. This method was then tried again with W. D. Kelly, a drilling contractor, in charge. A 16-inch nipple was welded into the end of a joint of 12-inch pipe, forming a semi-elbow. A runway was erected to skid the apparatus into position with the aid of guy wires. More than a dozen boilers were charged to capacity and connected by flow lines to the well site. The steam was used to lift the blaze above the men, who swung the nipple into position and attached it to a collar around the casing. A gate valve included in the operation was slowly closed. When production was pinched in, steam and water blew out the fire.

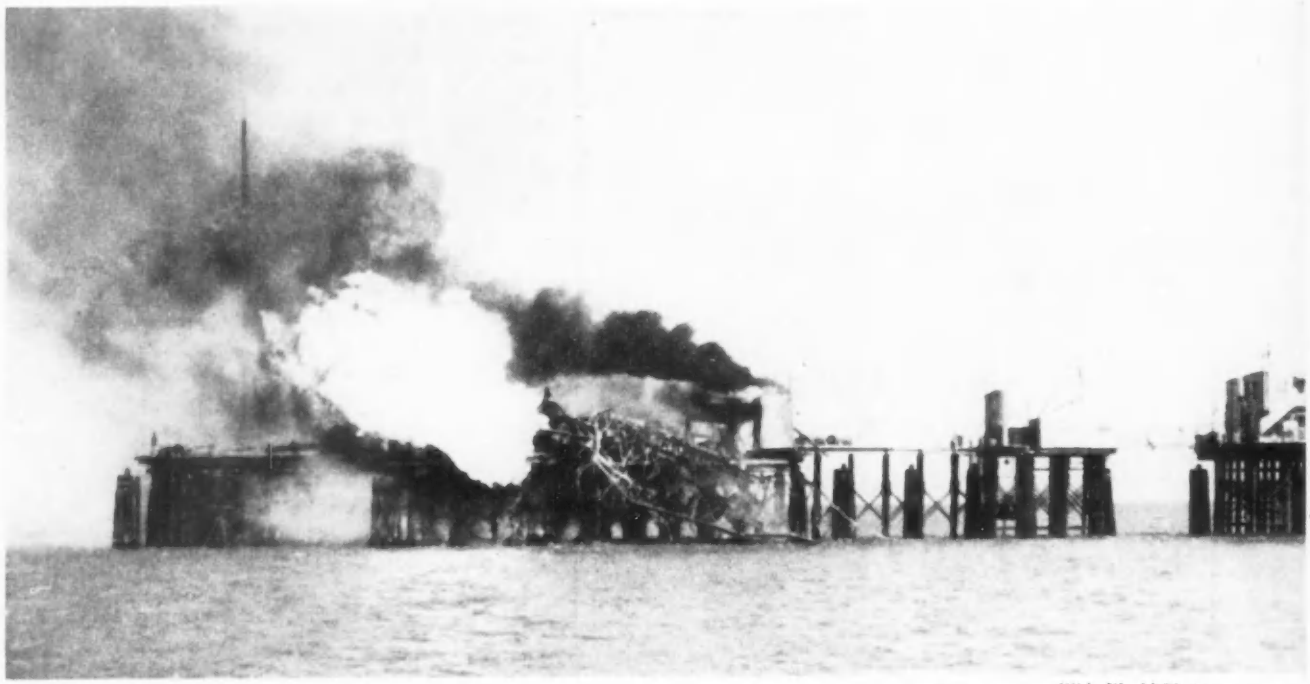
It was about this time that the Kinley family moved to Tulsa from Bakersfield, Calif., where Karl was a machinist and later a driller and well shooter. He was also a part-time firefighter after he stumbled upon the technique of killing a fire with explosive.

The well was in the Taft field and the year was 1913. A generous dousing with water failed to bring results, so somebody suggested that a smothering blanket of soil might be hurled on the flame by setting off dynamite near the wellhead. The charge was set off, and extinguished the fire for a few seconds.

Subsequently, Karl Kinley explained to the curious that gas fires have a mixing chamber, a 3- to 15-foot space between the bottom of the blaze and the mouth of the well, in which the gas and air mix. An explosion set off close to this chamber


SMOKE AND FLAMES DRIVEN BACK BY MOVIE WIND MACHINE
WIND MACHINE MOVED CLOSE TO BLAZING WELL ON BOARD TRACK OVER LAKE OF OIL AND MUD
WORKER IN ASBESTOS SUIT TURNS OIL VALVE WITH HOOK ON LONG POLE
STREAMS OF WATER FROM FIRE HOSE PLAY ON WORKER

AN EARLY FIRE-FIGHTING METHOD is depicted in this drawing which appeared on Page 1 of the Los Angeles Evening Herald, June 15, 1929. A wind machine was supposed to blow away the flames while the firefighter closed valve with a two-pronged pole.



Wide World Photo

FIRE OFF LOUISIANA COAST. This well caught fire this year. Kinley was called in on the job. Double trouble developed when blaze touched off another well on same platform.

breaks the gas flow long enough for the blaze to disappear.

At Tulsa, the elder Kinley occupied himself principally with the Western Torpedo Company, a well-shooting firm, though he extinguished several fires in the Desdemona, Texas, field. When Karl returned to California, Myron organized the Standard Torpedo Company and also went into the fire-fighting business with Brother Floyd. The latter devoted most of his time to shooting.

Their success was instant, dramatic—and almost unnoticed. Two fires broke out a short time apart in the Cromwell, Oklahoma, field in 1924. One burned ten days before it was extinguished with steam from 12 boilers. Kinley killed the other with dynamite in just 18 hours.

Kinley's performance was all the more impressive for having been accomplished without helpers. Drilling crewmen who would have tried the Burr Gillispie method had a shuddering distaste for being blended into the landscape by the Kinley process.

One-Man Job. Lacking assistants, Kinley had to devise some one-man methods. On the Crowell job he suspended 17 quarts of nitro (3½ pounds to the quart) to a line rigged with a pulley between two trees on opposite sides of the well. The charge was pulled over the wellhead, touched off, and the fire was out.

Small charges could be suspended from the end of a long pole, usually made of tubing, and maneuvered in an arc over the flame by means of a fulcrum.

During these lean years when he was perfecting his techniques and fighting for recognition, Kinley improvised furiously. Because of the growing necessity for traveling far and fast, and because he could never be sure of the materials available at the scene of a fire, he never permitted himself to rely on a standardized or prefabricated tool.

(In recent years he has made a lone departure from this custom. He built a water-cooled hook which would save considerable time if it were duplicated and stored in oil fields around the world.)

When in need of power, he has never quibbled. Once he used a team of horses to snatch off a wellhead. Wagons, carts, sleds, buggies, barrels and many another odd contrivance knocked together on the spot have been employed to move the charges into position. He uses no standard quantity of dynamite, but takes a long squint at the flame and starts slicing until he feels he has enough.

When he demanded water on a recent job, an engineer who was thinking in terms of gallons per minute wanted to know exactly how much.

"Lots of it," said Kinley.

Never one to sneer at an idea because it wasn't his own, he has often fallen back on the old steam method to divert the flames; on at least one occasion he resorted to the ancient snuffing technique; and his big triumph in Roumania was ultimately achieved by the very same method his father was attempting when he blew out the Taft well.

Roumania Job. The Moreni well was in the heart of the oldest producing area in Roumania, about 200 miles from Bucharest. On May 22, 1929, it came roaring in at an estimated 150 million cubic feet from a depth of 4793. The drill pipe was spewed out like toothpaste. Four men died.

A tunnel was begun to tap the 14-inch casing 70 feet below ground. It was 200 feet long when gas seeped in and exploded. Four more died.

A second tunnel was begun, but quickly filled with gas from the porous structure and was abandoned.

The operator planned a third tunnel which was to have been 800 feet long, lined with concrete, and was intended to tap the pipe about 270 feet below ground. The government, jittery now, would not permit it.

A new government engineer came on the job and the tunnel was begun. Gas seeping from the first tunnel was exploded by an acetylene torch. The death toll mounted. Water came in, was pumped out, and the tunnel lined

with board. Two 12-inch pipes were run in to circulate air. Another explosion killed one man and injured several.

A directional well failed because the formation was too tight and water could not be pumped through to kill the flowing Moreni.

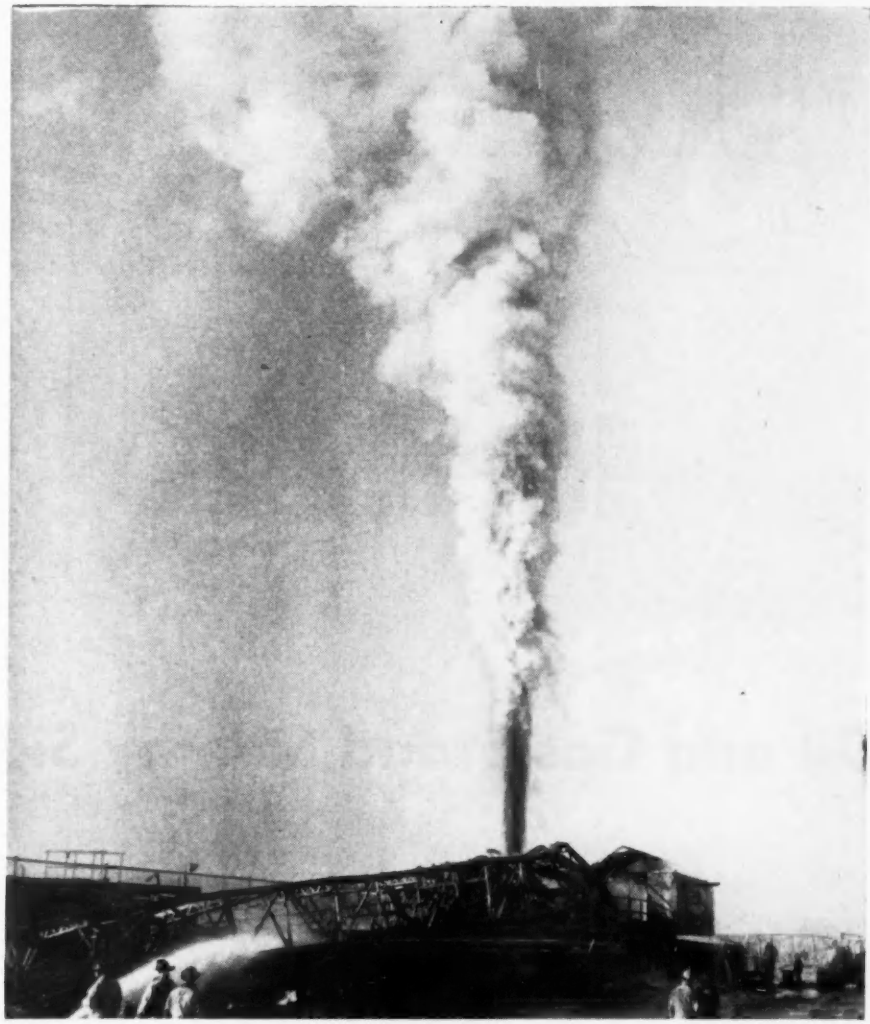
The company had now spent an estimated $750,000, not counting the gas consumed, and had nothing to show for it but a roaring fire in a crater 67 feet deep and 250 in diameter.

Kinley, meanwhile, had gone to Roumania with Clyde Gray, Tulsa independent, and submitted detailed plans for extinguishing the fire. The company was willing, but the first time he used the word "explosive" in the hearing of government officials who were even then listening for another tunnel explosion, he aroused a chorus of headshakes remindful of palsied spectators at a tennis match.

Returns to Vienna. A year after the fire started Kinley left a Rotary convention at Vienna and returned to Bucharest with movies of some of his accomplishments. The fire had become a political issue and the old government had fallen. Enough new officials supported him that he was able to get the job with the oil company's help. But he had to agree to cap the flow—always before he had only put out the fires—and to limit the size of his nitro shots. Fearful of more deaths, the government limited him to only two assistants, Grady Chupp, an American who was a former employe of the company, and Costica Lupa, a Roumanian.

In a desperate bid for understanding and cooperation, Kinley demonstrated his technique to government officials. He carried explosive into the crater and shot out the flame. He knew the gas would be instantly reignited by the molten debris, but the officials howled the first of the thousands of complaints he was to hear before the job was finished.

Approaching his task, Kinley looked out over a crater 250 feet in diameter, with an inner crater beginning 30 feet deeper and sloping down to a fire 60 feet across and encircled by hundreds of smaller flames from seepages around the wellhead. Littering the inferno, and some of it deeply buried, was molten debris from the original rig and the numerous devices used to fight the fire.



FIRE ON A GOLF COURSE. Red Adair, Kinley's No. 1 aide, was injured by a crane while fighting this fire on the Inglewood, Calif., Country Club golf course last year.

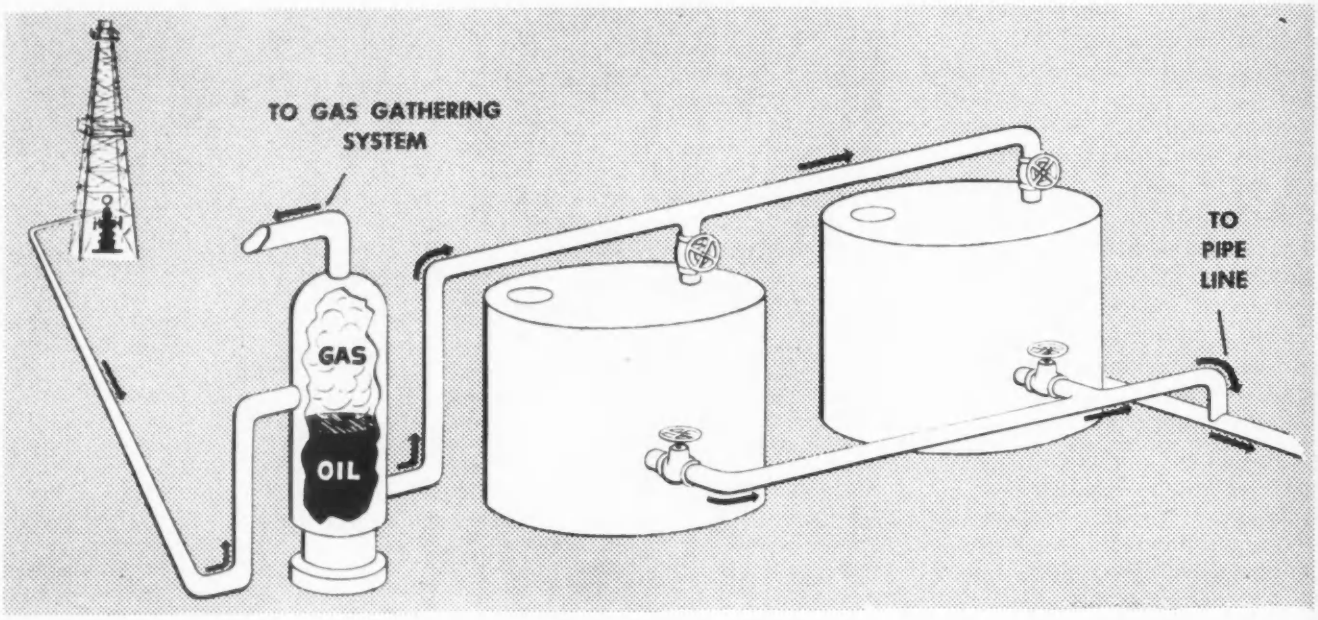
Kinley diverted part of the gas through the old No. 1 tunnel and pumped in thousands of gallons of water without noticeable effect. He pumped in cement and watched it disappear. Persisting, he assaulted each little blaze. He poured cement, let it set, and poured again, slowly edging toward the main blaze. All the while he was removing debris, and finally all the original equipment was collected except the engine.

Unexpected Help. Then came the rains. Then snow. Then a landslide that smothered the main fire. It blazed up again and was smothered by another landslide. Kinley, perhaps thanking heaven for the tip, began forcing landslides with explosive blasts. The crater was filling up. A final 50-pound shot snuffed out the main blaze. He brought in a 30-foot stack with a funnel-shaped base, maneuvered it over the gas jet with tractors, and cemented it. The job was done and the well was put on production.

Nowadays, while waiting for fire and blowout calls—he averages about 12 a year—Kinley commutes leisurely between his home in Bel-Air, Calif., and the M. M. Kinley Tool Company of Houston, which is run by his son, Jack.

At 57, he's comfortably fixed, though his fees are less astronomical than reported. He says he always knows when somebody has written a story about him, because he is subsequently besieged with begging letters. He charges a flat fee for each job and tacks on more if complications arise.

Reporters have insisted on glamorizing him with quotes about going on and on until they carry him out feet first—finally conquered by his great antagonist. However, his true feelings about calling it quits are more practical. "Retire, hell! What would I do then?"—**THE END**



Oil and Gas Stand Side by Side

Interdependence of the industries raises some serious questions of mutual responsibilities.

By PAUL KAYSER, President, El Paso Natural Gas Company

IF THERE IS one trend in our time that is clearer than all others, it is the inevitable trend the world over toward interdependence. Not all of us like it, but none of us can intelligently deny it.

But the influences that bear upon us and forces that shape the long-range course of the industry are first nationwide in their scope and then worldwide in their effect. It is easy to see those that are nationwide because they are near at hand. We all understand that anything that affects the automobile industry in the U. S. obviously directly affects the oil industry. Likewise, since practically all railroads have now changed over to diesel engines, anything that affects the transportation business of the country directly affects the oil industry.

Developments in the chemical industry have opened wide new avenues to the oil industry for a new range of chemical products from petroleum useful to the consumer and a large new source of profit to the oil industry.

But recent widespread development of the natural gas industry has even greater significance. Its impact on the oil industry will probably be greater than any other single factor in the immediate future.

The reason for this significance lies in the fact that up to 1942 the natural gas industry was only local in its nature. But developments since have made it nationwide in its scope.

At the present time, more than 75 percent[1] of all consumers of gas in the nation use natural gas, and more than 94 percent of all gas sold in the nation is natural gas. If butane and propane are included in the classification of "natural gas," then more than 79 percent of all consumers use natural gas and more than 96 percent of all gas sold is natural gas. Butane and propane in general come from the same wells as natural gas and, hence, the classification is proper.

To bring that situation about, the gas industry has constructed a great network of large-diameter, high-pressure pipe lines criss-crossing the nation literally from one end to the other and connecting practically every center of population in the entire nation with sources of supply. This has been done by the construction of more than 44,000 miles of large diameter pipe lines with appropriate compression at a cost in excess of $4 billion.

This constitutes a great transportation system from the face of the sands at the bottom of wells, 1000 feet to 15,000 feet below the surface, across thousands of miles of varied country to the connections into the distribution systems at the city gates, and thence into the millions of homes and factories throughout the nation.

It is the most efficient and most nearly automatic transportation system the world has ever seen. There is no break in the transportation from the sand where nature has stored the supply directly to the valve at the point of consumption. Nothing stands between the source of supply and the

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consumer except the valve he can turn at will.

In every other system there is a break in the transportation, and individual handling is necessary. In the case of every other commodity we use, we must go and get it or arrange to have it delivered. But in the case of gas you only have to turn the valve and even the lighting is automatic.

When we say it is the most efficient system, we are speaking by the book. The four leading sources of energy are coal, oil, gas and electric power. Electric power cannot be economically transported much in excess of 350 miles and hence does not compete for long distances.

Competent engineers have made graphs showing the most efficient and economical methods of transportation of a unit of energy. This graph shows that next to the transportation of oil, the transportation of natural gas by long distance, large diameter, high-pressure pipe lines is the most economical method for the transportation of a unit of energy. Because gas can be directly connected into the utility distribution systems and by this means continuously made available to the consumer, its transportation from the source of supply to the ultimate consumer is even more efficient for this purpose than oil.

It is apparent then that the natural gas industry is essentially a vast, intricate transportation system for the service of the consumer, made up of three component parts:

- Distribution companies.
- Pipe lines.
- Producers.

Each of these elements is absolutely essential to the business and, therefore, to each other.

Whether you like it or not, the operation as a whole is essentially a utility operation. It is now national in its scope and probably affects the lives of the people more intimately than any other national utility. The significance to the oil industry of this fact cannot be overstressed.

The vast majority of all gas marketed is produced by the oil industry, consequently you cannot escape the fact that the oil industry constitutes one of the three essential segments of the natural gas industry. The natural gas industry is certainly to that extent dependent upon the oil industry.

Production of natural gas by the oil industry in the main is a by-product operation. Because of this fact and regulation by the Federal Power Commission under the Natural Gas Act, marketing of gas other than field sales is done almost exclusively by the natural gas industry. To this extent, the oil industry is dependent upon the natural gas industry.

But the oil industry is dependent upon the natural gas industry in another and still more important respect.

As illustrated by the recent shutdown of the Spraberry field, the oil industry is certainly dependent upon the gas industry to market the gas associated with oil in order for the industry to produce its oil. This interdependence will certainly become more and more important as deeper drilling finds oil with higher gas-oil ratios and as both oil and gas become scarcer and conservation of all products from a well become more and more important in the full economic development of this natural resource.

In the distant future if all petroleum reserves should be exhausted and synthetic products should be made from coal to take the place of that now made available through discovery, then the interdependence of the two industries is all the more apparent.

At that time probably the most practical way to manufacture such products will be by the construction of huge plants at the mouth of the coal mine. Experimental work already done on pilot plants indicates that such plants can produce high BTU gas but at the same time and as part of the process they will produce diesel and other liquid fuels and a great variety of basic products of the chemical industry. The gas can be marketed through the present network of lines of the natural gas industry and the liquid fuels and chemical products can likewise be marketed by the petroleum industry.

But the main point of interdependence between the two industries lies in "discovery." The figures for 1952[2] show that there are sufficient proved reserves of oil in the U. S. to run the industry at the present rate of production for 13 years.

Figures for the same year show that the proved gas reserves are sufficient to run the gas industry at the present rate of production for 23 years. If these two great industries were only going to last these years then we should begin to liquidate them now and make provision for some other source for the required energy. But the only thing that will keep this from occurring is "discovery."

Table 1 from the record shows this clearly.

Due to what we believe is a fundamental error in policy by the FPC, practically all exploration for gas is carried on by the oil industry, mainly as a necessary incident to the production of oil. Under the commission's rules a pipe line company cannot make more than six percent on its own production. This has had the effect of penalizing those companies who, prior to the rule acquired substantial reserves and has discouraged all pipe lines from attempting directly to explore for gas.

In my judgment this rule is not in the interest of the consumer. His interest lies in a continuous and dependable supply for the maximum length of time at a reasonable price. The continuity of the supply is obviously dependent upon discovery. No one is going to risk his money in so hazardous an undertaking as exploration for gas for a six percent return. Without discovery the consumer cannot get his supply for a long enough period to justify his reliance upon gas as one of his major sources of energy. If he is to

TABLE 1

YEAR	Oil Reserves	Production	Years	Gas Reserves	Production	Years
1948	26,821,227	2,186,197	12.27	173,869,340	6,007,628	28.94
1949	28,378,501	2,017,347	14.07	180,381,344	6,245,041	28.88
1950	29,536,061	2,171,187	13.60	185,592,699	6,892,678	26.93
1951	32,192,623	2,481,373	12.97	193,811,500	7,966,941	24.33
1952	32,957,205	2,541,554	12.97	199,716,225	8,639,638	23.12

have the supply for the reasonable period, he must pay a price that will justify exploration and discovery. There is no other way he can be assured of such supply.

Consequently, he must pay the price first and last, if he is to get the gas, and it certainly is to the consumer's interest to pay it to the pipe line company so as to be assured that when it is discovered it will be devoted to his service. This is a situation that we believe will in time be remedied by a sensible relaxation of the FPC rule so as to reward the pipe line companies for diligence in exploring for and discovering gas instead of penalizing them for such foresight.

Because of this situation, the natural gas industry is primarily dependent upon the oil industry for "discovery," which is the basis for a continuous, dependable supply over the years.

This interdependence raises the most serious questions of responsibility the one to the other. The responsibility rests on the gas industry, particularly the pipe line companies and the distributing companies, to do everything possible to see to it that the price paid for gas in the field is sufficient to stimulate and sustain exploration and discovery.

But likewise the obligation rests on the oil industry as the principal producer of gas to see to it that exorbitant prices are not charged and that particular situations are not taken advantage of to raise the price beyond reasonable bounds.

It is common knowledge that the price of gas in the field in the past has been excessively low based upon its intrinsic value. But it is also true that the reason the price has risen and is now reaching levels approaching its true value in relation to the market demand is that the vast net work of pipe lines have been built by the natural gas industry in the last ten years and the surplus gas in the southwest that necessarily held the price down has now been taken to market.

Price of gas in the field in the southwest has more than doubled in the last six years.

But the most dangerous thing the oil industry can do is to press the rise of the field price too rapidly. Oil producers must remember that they are one segment of the natural gas business and this business now is essentially a nationwide regulated utility operation in all its functions except production, and the Supreme Court in the very near future may hold that such operation is likewise subject to regulation.

But in all events, the majority of the public in this country now use this service and if the public feels that it is paying too high a price it will certainly demand from the Congress laws for its regulation. Regulation of the production of gas is but a single short step from the regulation of the production of oil.

It, therefore, should be the aim of both industries to see that the low level of field prices is raised as rapidly as is consistent with the public interest and that the impact on the consumer is softened as far as possible.

Both should endeavor to educate the public to the fact that the field price must be sufficient to stimulate exploration and reward discovery so supply of this premium fuel may be available for the public service for the full life of the total resource stored by nature for our use.

We all speak of a free economy. Obviously, there can be no such thing as a free economy in any absolute sense. Every industry to some measure is dependent upon every other industry in the same economy. The great mass of the consuming public are the true masters of any economy. Shortsighted, selfish action if generally persisted in can only bring unrest and dissatisfaction to the public. When that conduct pinches, the public always turns to laws to correct the abuses.

We have just gone through a period in which the people stampeded to pass laws to correct real and fancied economic abuses, and we went a very long way down the road towards a socialistic state. But the pendulum has swung back again, and we now stand, I believe, at the threshold of an era of magnificent opportunity.

If we do not live up to this opportunity, then we can only lapse back into the old trend which inevitably leads to the socialistic state. Under present conditions in the world, perhaps none is able to run a socialist state except the Communist party and in the light of recent history that is the fate we can reasonably expect.

However, if we have the sense, the foresight and the character to seize this opportunity and use judiciously enlightened long-range self-interest instead of shortsighted narrow selfishness, we may lead the entire world into the attainment of a richer economy than the world has ever seen before.

In any economy that has a measure of freedom its success or failure rests with the leaders of business enterprise. The unit of our economy is the corporation and the true responsibility for the health and vigor of our economy rests on the leaders of the corporations of the country.

To say that we must have recurring periods of severe depression and unemployment is simply to say that our leaders do not have intelligence enough to run their business on an even keel. If these leaders act in accordance with long-range enlightened self-interest, then our economy can continue to grow and supply human needs beyond any rate yet achieved.

We have the chance now to demonstrate the strength of our economy. It may be the last chance because if we miss it the game probably will be called on account of darkness.

—The End.

About the Author

PAUL KAYSER was born at Tyler, Texas, in 1887. He was graduated by Baylor University in 1909 with a B.A. degree. From 1913 to 1929 he practiced law, and then became associated with El Paso Natural Gas Company, which he now heads. He is also president of Western Natural Gas Company and a past president of the Independent Natural Gas Association.

ACKNOWLEDGMENT

This article is from a paper presented at the Mid-Year meeting of the Independent Petroleum Association of America at St. Louis, Mo., April 27, 1953, under the title "The Inter-Dependence of the Oil Industry and the Gas Industry."

REFERENCES

[1] Preliminary figures 1953 from AGA records.
[2] AGA-API Reserve Committee report.

Automatic Controls Are Increasing Efficiency in Oil Industry

Efficiency is the key to meeting competition in the oil industry, and an increasingly important way to promote efficiency is by using automatic controls.

Automatic devices, such as gauging and controlling equipment, have proved successful and will be used increasingly in certain routine oil field production operations. These are applicable especially where lease activities proceed 24 hours a day but are attended to by men only part of the time. (An automatic tank battery in the East Texas field was described in World Oil, April, 1953, page 195.)

Automatic controls also are promoting efficiency, reducing operating costs, and giving other advantages in numerous other operations in the oil and gas industries.

On drilling rigs there are numerous automatic devices in use. Among the most important is the automatic drilling control. It maintains constant pressure on the drilling bit, and will feed off evenly. If during a driller's absence the rotary is stopped, the feed control automatically discontinues feeding off the drill string. This device offers greater penetration and it may even drill faster than the human driller. Automatic lubrication systems save time and machinery. When drilling fluid pressures build up too high, certain devices will trip a relief valve and lower the pressure and then automatically reset the valve.

Electronic computers permit rapid solutions of problems in reservoir engineering, besides handling records in the accounting departments.

Pipe lines make wide use of automatic controls and regulators, and in the future may be virtual pushbutton systems. Helping to make the oil and gas pipe line operations automatic will be the microwave communications systems, in which the oil and gas industries have pioneered and led in number and cost of installations.

In petroleum refining, automatic controls are used widely and represent an important factor in making it possible for plants to hold down costs while improving the quality of products. Meanwhile, refinery workers are paid wages far above average, and employment is maintained or increased by virtue of constantly increasing demand for petroleum products.

While the principal advantage of automatic controls is the reduction of operating costs, there are also other important benefits, such as the promotion of safety, perfection of quality, acceleration of operations, reduction of waste, and stimulation of production.

In the next several years, sales and installations of instruments and automatic control devices will increase sharply, it is predicted. Heretofore, those developing automatic controls have directed their attention especially to military devices, but henceforth they may be able to give more consideration to civilian equipment. Increasingly keen competition in business is expected, and it will naturally force companies to achieve maximum efficiency. In seeking to cut costs, they will turn increasingly to the automatic control devices.

You Can Help Cut Federal Spending

You can help curtail federal government spending and bureaucracy by working with others to reduce federal aid to state and local governments.

A commission on Intergovernmental Relations, created by act of Congress, will study the whole field of federal-state operations and report to Congress next March. It will seek to determine if states and communities could take over and better handle some of the 40-odd aid programs in which the federal government now participates and on which it spent $2.4 billion last year. It will need public support and much information.

The U. S. Chamber of Commerce is seeking to develop support of the commission and has suggested ways that businessmen and other citizens can help. It has called on state and local chambers of commerce to promote Citizens Committees. Those committees would promote State Commissions on Intergovernmental Relations in all states. The state commissions would determine ability and willingness of each state to take over some of the federal aid programs. Much research, educational work, and coordination would be needed within the states and in dealings with the federal commission, and the citizens committees could help in those efforts and make legislative recommendations.

New LPG Market

An important new market is promised for liquefied petroleum gas—in locomotives. The world's first propane gas turbine electric locomotive has made test runs and will regularly haul freight for the Union Pacific Railroad between Los Angeles and Salt Lake City.

Equivalent to three diesel units, it is a single unit, supplemented by a propane tank car. Cost of $125 per horsepower is about the same as for diesel electric units or gas turbines using bunker oil. But clean-burning propane avoids damage to turbine blades from corrosion and deposits and will reduce maintenance costs and time lost in overhauls. Other advantages are flexibility, fuel economy, effective pulling power, and outstanding performance on grades.

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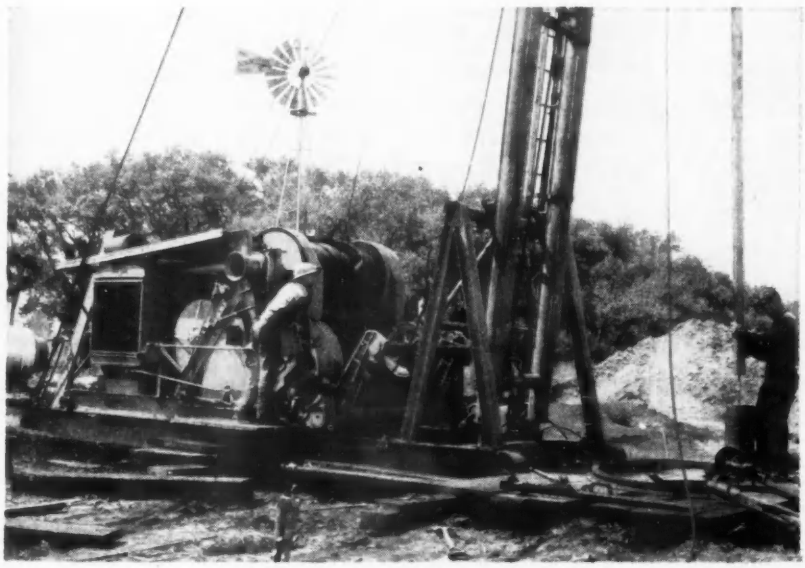
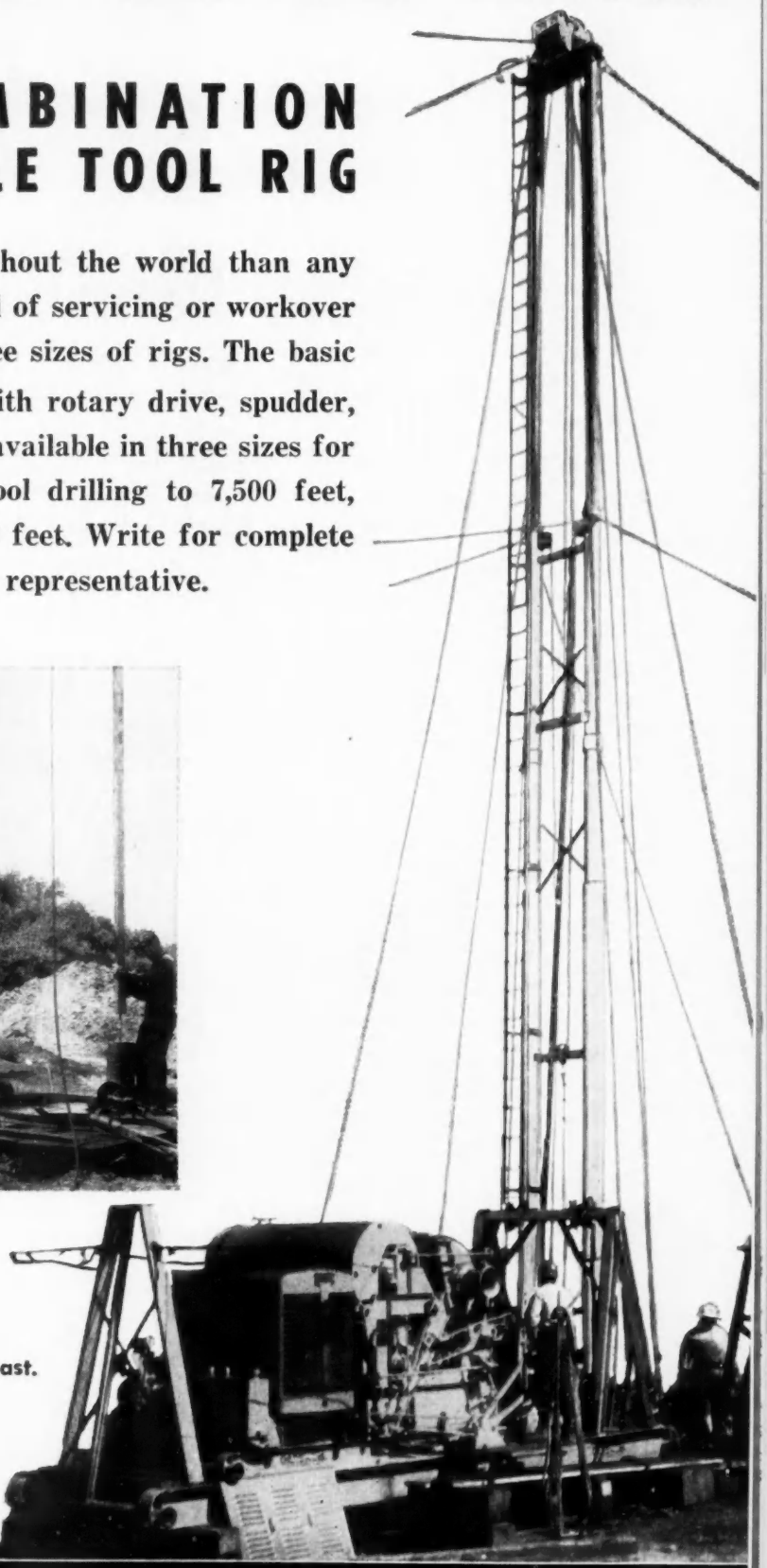


Double drum with spudder on drilling-in job.



Three-drum rig with spudder and 65-foot mast.

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By **RAY L. DUDLEY,** Publisher, and **WARREN L. BAKER,** Editor

Excessive Supply Darkens Outlook

SERIOUSLY THREATENING the industry's economic position is the continued high rate of supply. Recent refining, producing and import rates have been too large, and if maintained at present volumes soon will create excessive stocks.

This prospect calls for the industry to exercise greater caution in its producing, importing and refining rates during the next three months. Otherwise, there is a possibility of price reductions and quite drastic curtailment of operating levels being experienced by the end of the year.

This is the outlook although spread of higher crude oil prices to Venezuela and the Middle East has added considerable strength to the recently advanced U. S. prices.

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ESPECIALLY DISTURBING is the refined product outlook. High refining levels are resulting in the production of too much gasoline and distillate fuel oil. Current additions to product stocks are at a rate close to those made last year, when the industry was forced to operate at full capacity to make up for the withdrawal of approximately 50 million barrels from inventories during the refinery strike.

Crude runs have been consistently exceeding year-ago levels. During one recent week they hit an all-time record of 7,267,000 barrels per day, 70,000 barrels greater than the weekly peak attained in the 1952 post-strike period.

Additions to stocks of the four principal refined products during the first two weeks of July were at a rate of 700,000 barrels per day, compared with a rate of 800,000 barrels per day in the like 1952 period when the industry was striving to make up losses which occurred during the strike. The situation this year is entirely different from last year, the industry is not confronted with the necessity of making up for heavy stock drafts as in 1952.

These conditions indicate an increasing need for reducing refinery runs so as to avoid creating excessive stocks. This is the chief key to the future. There definitely is no economic need for continuation of refinery runs at recent high levels.

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IT IS FORTUNATE that demand so far this year has been well above expectations. High consumption has kept record new supplies from creating excessive inventories.

Aided by a sharp boost in demand during June, total demand for all oils in the first six months of 1953 was more than 8,100,000 barrels daily, or 6.4 percent over the like period of 1952.

There are no assurances that consumption rates will hold to this level for the remainder of the year. The sharp boost in June demand was due in a large part to exceptionally favorable weather for gasoline consumption and possibly to accelerated buying of refined products before price increases followed the mid-June hike in crude oil postings.

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AMPLE SUPPLIES to fill requirements appear assured, even should demand for the balance of the year continue its record-breaking pace. While demand during the first half of the year was rising 6.4 percent over the like period of last year, new supply was averaging 8,200,000 barrels daily, a gain of 7.2 percent.

U. S. crude production for the first six months of 1953 amounted to 6.1 percent more than in 1952, and output of other liquid hydrocarbons advanced 9.6 percent. Thus, total domestic supply reached 7,134,000 barrels per day, up 6.4 percent over 1952. Meanwhile, crude oil imports were up 23 percent (11 percent in the area east of California) and product imports increased slightly to boost total imports to an average of 1,068,000 barrels per day, up 14 percent over the first half of 1952.

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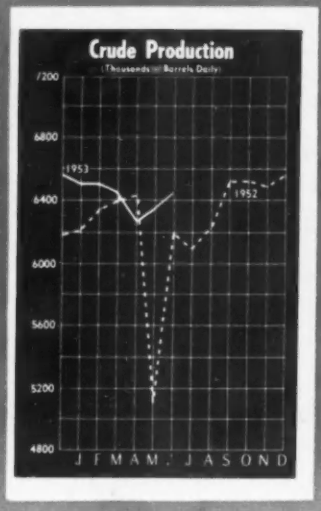
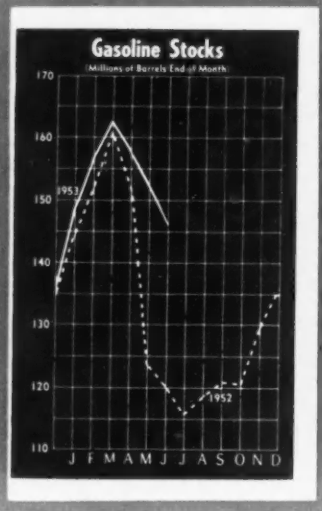
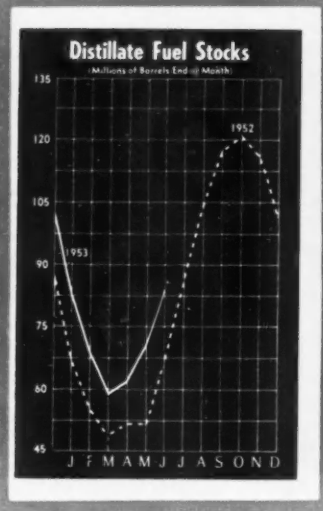
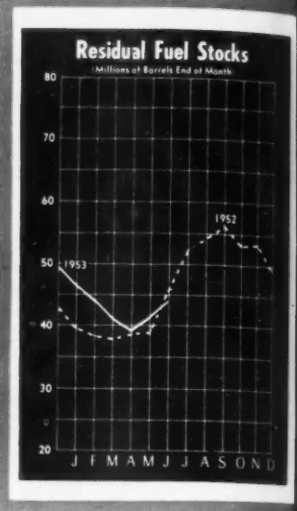
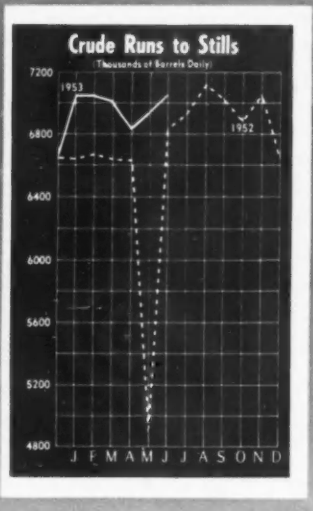
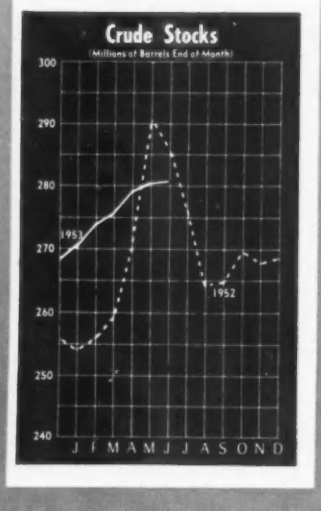












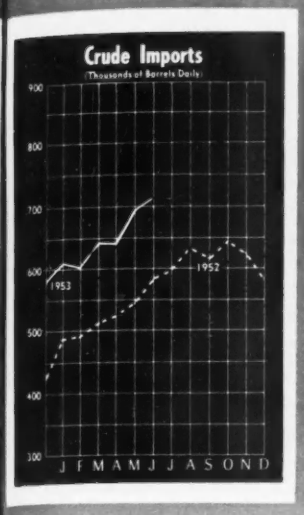
Petroleum Trends in the U. S.

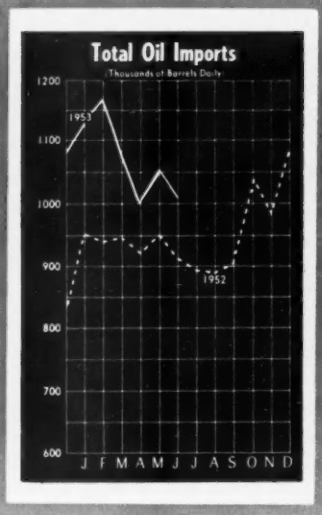
drilling operations maintain high level . . .

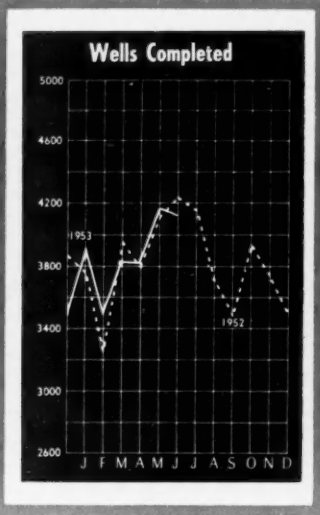
By CECIL W. SMITH, WORLD OIL Staff

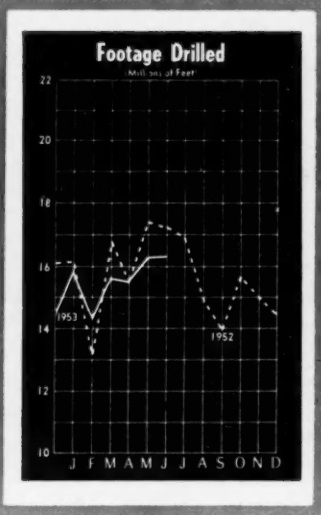
U. S. Crude Production by States
(THOUSANDS OF BARRELS)

STATE or DISTRICT	DAILY AVERAGE PRODUCTION June, 1953	May, 1953	June, 1952	% Diff. June, '52-'53	TOTAL PRODUCTION First Six Months 1953	1952	% Diff. '52-'53
Alabama	5.0	4.8	2.3	+117.4	858	460	+ 86.5
Arkansas	77.8	77.5	78.7	— 1.2	14,494	14,697	— 1.4
California	1,013.8	1,003.3	986.4	+ 2.8	180,714	178,382	+ 1.3
Colorado	103.5	97.5	78.3	+ 32.2	15,924	14,026	+ 13.5
Florida	1.5	1.5	1.7	— 11.8	268	310	— 13.6
Illinois	162.9	162.5	159.6	+ 2.1	29,233	28,623	+ 2.1
Indiana	35.7	35.4	35.3	+ 1.1	6,513	5,750	+ 13.3
Kansas	316.5	324.0	307.2	+ 3.0	59,757	53,898	+ 10.9
Kentucky	30.3	29.9	33.3	— 9.0	5,507	6,309	— 12.7
Louisiana	701.5	700.7	664.2	+ 5.6	127,894	116,833	+ 9.5
North Louisiana	113.4	113.3	114.7	— 1.1	21,024	21,499	— 2.2
South Louisiana	588.1	587.4	549.5	+ 7.0	106,870	95,334	+ 12.1
Michigan	33.8	34.2	37.4	— 9.6	6,168	6,680	— 7.7
Mississippi	98.0	98.2	98.7	— 0.7	17,948	18,162	— 1.2
Missouri	0.1	0.1	0.1		9	12	— 25.0
Montana	34.8	34.9	21.8	+ 59.6	5,674	4,298	+ 32.0
Nebraska	13.7	13.6	6.0	+128.3	2,655	960	+ 176.6
New Mexico	193.2	187.5	173.0	+ 11.7	33,711	27,663	+ 21.9
New York	12.5	12.6	11.8	+ 5.9	2,061	2,139	— 3.7
North Dakota	12.0	14.5	2.9	+313.8	2,585	205	+1161.0
Ohio	10.1	9.7	9.1	+ 11.0	1,684	1,567	+ 7.5
Oklahoma	534.2	532.7	537.6	— 0.6	99,327	93,435	+ 6.3
Pennsylvania	27.5	28.0	31.4	— 12.4	5,242	5,651	— 7.2
Tennessee					6	5	+ 20.0
Texas	2,804.8	2,716.4	2,725.9	+ 2.9	513,677	498,085	+ 3.1
Dist. 1—South Central	36.8	35.4	31.8	+ 15.7	6,574	5,982	+ 9.9
Dist. 2—Middle Gulf	159.4	152.8	147.2	+ 8.3	28,823	28,630	+ 0.7
Dist. 3—Upper Gulf	469.2	461.6	461.3	+ 1.7	86,631	84,816	+ 2.1
Dist. 4—Lower Gulf-S. W.	264.7	254.5	240.9	+ 9.9	47,049	46,750	+ 0.6
Dist. 5—East Central	49.1	47.2	54.2	— 9.4	8,965	10,483	— 14.5
Dist. 6—Northeast	379.4	372.9	389.2	— 2.5	69,093	71,196	— 3.0
Dist. 7-B—North Central	115.8	108.0	92.5	+ 25.2	19,777	15,647	+ 26.4
Dist. 7-C—West	165.7	154.6	137.8	+ 20.2	29,969	24,306	+ 23.3
Dist. 8—West	911.4	887.7	895.2	+ 1.8	166,340	167,753	— 0.9
Dist. 9—North	178.1	169.0	162.9	+ 9.3	32,460	28,478	+ 14.0
Dist. 10—Panhandle	75.1	72.7	82.9	— 9.4	13,534	14,912	— 9.3
Utah	5.2	5.6	5.0	+ 4.0	966	786	+ 22.9
Virginia		0.1			9	5	+ 80.0
West Virginia	8.0	8.2	6.9	+ 15.9	1,361	1,292	+ 5.3
Wyoming	224.6	216.0	182.6	+ 23.0	39,217	32,191	+ 21.8
Total United States	6,461.0	6,349.4	6,197.2	+ 4.3	1,173,462	1,112,424	+ 5.5









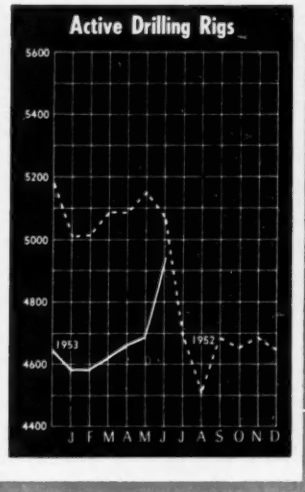
Crude producing and refining volumes continue up . . . oil import rates eased slightly . . .

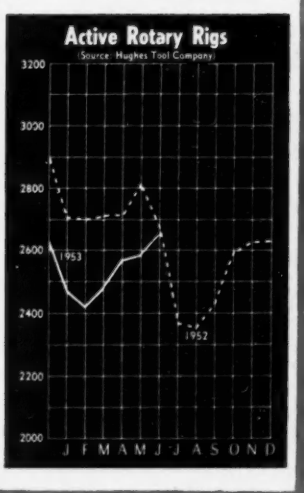
Crude Oil and Refined Products Trends

(Thousands of Barrels)

MONTH	CRUDE OIL			GASOLINE		DISTILLATE FUEL		RESIDUAL FUEL		DAILY IMPORTS	
	Production Daily	Runs to Stills Daily	Stocks End of Month	Production Daily	Stocks End of Month	Production Daily	Stocks End of Month	Production Daily	Stocks End of Month	Crude Oil	Total Oils
1951:											
May	6,170	6,436	248,418	3,031	141,658	1,210	59,272	1,265	39,879	518	876
June	6,130	6,575	248,170	3,100	137,000	1,254	72,140	1,277	42,398	563	876
July	6,141	6,462	250,847	3,091	130,931	1,228	84,282	1,275	46,320	546	788
August	6,232	6,539	254,276	3,114	124,202	1,237	94,028	1,226	48,365	529	780
September	6,261	6,558	254,900	3,127	124,530	1,282	104,082	1,228	49,608	500	744
October	6,375	6,446	262,266	3,105	118,864	1,295	109,544	1,224	49,573	421	769
November	6,272	6,609	261,100	3,130	122,723	1,358	101,666	1,304	46,491	425	802
December	6,182	6,646	255,783	3,150	134,867	1,442	86,619	1,313	42,853	423	834
1952:											
January	6,217	6,640	254,007	3,094	144,339	1,456	66,969	1,338	39,523	488	951
February	6,367	6,673	255,900	3,109	151,912	1,528	55,369	1,322	38,295	491	940
March	6,388	6,640	259,126	3,069	160,689	1,400	48,750	1,274	37,971	510	947
April	6,429	6,435	270,679	2,995	151,890	1,312	51,634	1,253	38,561	539	922
May	5,107	4,905	290,813	2,295	123,656	982	51,648	979	38,821	545	951
June	6,197	6,825	285,964	3,169	120,166	1,455	65,911	1,228	45,688	581	911
July	6,093	6,927	275,951	3,295	116,566	1,475	85,775	1,237	52,245	597	892
August	6,219	7,118	264,368	3,377	118,592	1,514	104,257	1,252	54,061	632	879
September	6,518	7,017	264,723	3,428	120,991	1,502	117,252	1,230	56,200	615	932
October	6,518	6,883	269,776	3,301	120,062	1,458	120,721	1,203	53,052	643	1,037
November	6,487	7,049	267,852	3,416	129,509	1,510	116,096	1,299	53,069	624	984
December	6,634	6,952	271,928	3,361	136,028	1,509	99,582	1,302	48,706	603	1,165
1953:											
January	6,555	7,042	272,250	3,384	150,518	1,528	80,655	1,307	45,910	616	1,135
February	6,562	6,969	273,589	3,379	157,873	1,505	67,167	1,275	44,178	586	1,066
March	6,531	7,002	275,665	3,319	162,731	1,489	59,802	1,256	41,600	655	1,112
April	6,446	6,781	280,487	3,282	158,032	1,424	61,349	1,219	39,572	628	1,010
May	6,349	6,952	280,285	3,321	152,457	1,356	71,695	1,228	41,572	693	1,054
June	6,461	7,071	280,785	3,462	145,907	1,480	84,478	1,235	44,087	712	1,008
Week Ended:											
7-11-53	6,483	7,267	279,813	3,572	144,053	1,462	90,253	1,281	47,154	654	966
7-12-52	6,075	7,013	283,808	3,322	118,332	1,455	72,515	1,278	48,395	540	775

Source: Data for last two months from API; prior monthly data from Bureau of Mines.





Oil Executives Put Price Case Before Congressional Committee

Independent refiners, spokesmen for independent oil producers, and others were being heard at the middle of July by the House Commerce Committee regarding increases in prices of crude oil and petroleum products.

They had been preceded by other oil industry witnesses, including executives of various major oil companies. The hearings were initiated July 1 by the committee's chairman, Charles A. Wolverton (R.—N. J.) in response to complaints made by independent oil jobbers and marketers, and others.

W. W. Keeler, vice president of Phillips Petroleum Company, explained why that company initiated the Mid-Continent crude raise with a 25 cents per barrel increase. He said the raise was needed to help cover increased costs and also to provide incentive for development of needed new crude reserves.

Hines H. Baker, president of Humble Oil & Refining Company, Houston, which promptly responded to the Phillips raise with increases of 10 to 35 cents, declared to the committee that the price increases were justified by increases in oil industry costs. He said that the new prices were determined through free competition; that they would stand if economically sound; and fall if not sound. Rep. John W. Heselton (R.—Mass.) said to Baker that it was "bunk" to talk of the free, competitive forces in the industry, "when you've got an allowable system that fosters a complete monopoly."

Wouldn't Stick. Competition in the petroleum industry was demonstrated in February of this year when Socony-Vacuum Oil Company posted increases in product prices and then was forced by competitors to rescind the increases. This statement was made by Herbert Willetts, director and vice president of Socony-Vacuum. Competition has kept the company's prices about 1 cent per gallon below what the company feels it should get for its products, he said. He stated that the February increases were posted following a survey by the company showing clear need for them. Wage rates had increased 18 percent without compensating increases in oil prices he said; the building cost index was up 10.7 percent, metal products had risen 11.1 percent; and trucks for oil marketing operations had risen 11.7 percent at wholesale; while the company's marketing expense had risen 10.2 percent. During questioning of Willetts, Rep. Heselton charged that oil industry executives in raising prices were "sabotaging" the Eisenhower administration by "contributing" to inflation and making harder the administration's job of economic stabilization.

At the opening hearing, Chairman Wolverton said that "these price increases at this time cannot readily be understood . . . Why gasoline and heating oil prices should go up just at this time, when commodity prices generally are soft and reflect a firming up of the purchasing value of the dollar, is hard to perceive."

Move Explained. Several major oil company executives later explained that the prices of oils were increased only in line with past increases in wages and costs, which could not be compensated for before in the oil industry because of government price controls, which were lifted only last February. At that time there were increases in prices of California and Pennsylvania grade crudes, and product prices were raised on the West Coast. As pointed out, one major marketer on the East Coast increased product prices in February but rescinded the increases when competitors continued to sell their products at the old levels.

Spokesmen for independent marketers complained of crude production allowables as conducive to a vertical monopoly, and some advocated such governmental action as repeal of the Connally "hot oil" act and legislation to force divorcement of the different divisions of the industry. Major company representatives replied that such divorcement would make the industry less efficient and result in higher costs of oil for the consumers.

Pipe Lines Reflect Growing Demand

Current pipe line work reflects increasing demand for oils produced and refined in the Rocky Mountain region.

Salt Lake Pipe Line Company, subsidiary of Standard Oil Company of California, is increasing the capacity of its products line from Salt Lake City to Pasco, Washington, besides building a 135-mile extension to it from Pasco to Spokane that will deliver 15,000 barrels of gasoline and heating oil per day, using one pumping station, at Pasco. That extension is due to be completed by the end of September.

The company will soon start construction of facilities between Salt Lake City and Pasco to provide a 20 percent increase in capacity of the 566-mile line at estimated cost of $1,700,000. The project will include a new pump station at Huntington, Oregon; additional pumps at Juniper, Idaho, and Baker, Oregon, stations; 40 miles of additional 6-inch line between Adams, Oregon, and Pasco, and five 12,500-barrel tanks at Boise, Idaho. These new facilities will increase the capacity of the line to 42,500 barrels per day from Salt Lake City to Boise, Idaho, and to 22,500 barrels daily from Boise to Pasco.

At Salt Lake City there are several refineries, including that of Salt Lake Refining Company, another Standard of California subsidiary, with 27,000 barrels per day of crude oil capacity. Salt Lake City plants are supplied with crude from fields of the Uinta Basin, Utah, and the Rangely field of Colorado, Salt Lake Pipe Line Company having a crude line from Rangely to Salt Lake City.

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Petroleum Market Stable, Heating Oil Resists Price Increase

The markets for petroleum and petroleum products have been fairly stable following the late-June increases in prices of crude and products east of California.

However, as anticipated, the markets for heating oil and heavy fuel oil have put up appreciable resistance to price increases, and in some cases, refiners have rescinded a part of their recent increases for heating oil. For example, Esso Standard Oil Company, an East Coast marketer, reduced distillate fuel oil prices by 3/10 cent a gallon effective July 2, after having posted increases of 6/10 cent on June 22. The company furthermore kept in effect its summer-fill discount of ½ cent per gallon.

Meanwhile, some distillate fuel oil continued to be offered by some independent suppliers and by one major company at the old prices that prevailed before the crude price raise.

When Esso Standard raised heating oil prices June 22 by 6/10 cent a gallon, it also raised gasoline 8/10 cent a gallon and residual fuel by 15 to 25 cents a barrel. No. 6 fuel oil was raised to $2.25 per barrel at New York from $2.10.

Import Jump? This increase was expected to encourage more imports of residual fuel oil, including shipments from France and other Western European countries which are now processing comparatively large volumes of Middle East crudes in new refineries built in the past few years with aid of the U. S. In late June a cargo of French residual fuel oil was booked for delivery in New York at a reported price of $1.75 per barrel not including tariff of 5¼ cents per barrel. Another cargo of residual had been shipped from France to New York several weeks previously.

It was indicated that other shipments of heavy fuel oils from Europe would be made, in view of higher prices in the U. S., current low tanker rates, and excess supplies of residual fuel oil at European refineries.

Wholesale and retail prices of petroleum products have been advanced generally east of California in compensation for the recent raise of about 25 cents a barrel in prices of crude in the Mid-Continent, Rocky Mountains and Middle West.

Also, prices of crude in the Caribbean area and the Middle East were advanced in line with the U. S. crude price increases. Creole Petroleum Corporation, effective June 23, posted a new price schedule for Venezuelan crudes, providing for increases of 10 to 30 cents a barrel over previous postings, depending on gravity. Heavy crudes from certain fields were raised 10 cents per barrel, some fields got 25 cent raises, and the high gravity crude from one field (Cumarebo) was advanced 30 cents to $3.40 per barrel f.o.b. Tucupido. Crude of 35.0-35.9 gravity from Mulata was raised 25 cents to $2.88 per barrel f.o.b. Puerto La Cruz.

On July 8, Gulf Oil Corporation announced increases of 25 cents a barrel in prices of Middle East crude oil.

Other Increases. In the extensive Middle Western area of the U. S. where it markets, Standard Oil Company (Indiana) on June 22 advanced its tank wagon or wholesale prices for gasoline by 3/10 to 1 cent a gallon, depending on local competitive conditions. Heating oils were raised from 3/10 to 8/10 cent per gallon. Humble Oil & Refining Company, largest marketer in Texas, effective June 23, increased its tank wagon (wholesale) prices on gasoline by 7/10 cent a gallon in general and by 1 cent a gallon in certain areas remote from supply sources.

Previously, numerous companies had announced increases in tank wagon prices of products in nearly all sections of the U. S., following the crude price raises. Continental Oil Company on June 17 posted increases of 1 cent a gallon for gasoline, ½ to 1 cent a gallon for kerosine, ½ cent on heating oils and 25 cents a barrel for residual fuel oils. The company markets in the Rocky Mountain states and Oklahoma.

Similar advances were made by Cities Service Oil Company in the Chicago market, Lion Oil Company in Arkansas, and other marketers. Even before the crude raises, wholesale prices of products had been increased in the New York and New England areas.

Tidelands Exploration Is Becalmed

Offshore oil development moves forward slowly, cautiously, despite restoration of title to the states. It takes blue chips to bet on offshore fields, and oil companies are studying the cards with extreme care and deliberation.

Laymen have talked loosely of $118 billion to $300 billion worth of oil beneath the submerged lands. These are wild guesses of ultimate gross value. Actually, to get that much oil by expensive marine exploration and development might cost even more billions. So far, 116 wells out of 227 drilled in the Gulf have been dry holes, and investments have been five times the amount recovered, though certain properties have been developed to the point where economic operation is assured.

The oil beneath the Gulf of Mexico, like the fishes in it, can not be counted as having true value until actually recovered.

The state of Texas on September 1 will hold its first sale of submerged lands oil and gas leases since Congress enacted the new tidelands law, recognizing state's claims. Texas Land Commissioner Bascom Giles said "a few" tracts in the Gulf will be offered at the September - sealed-bid sale, along with riverbed and upland acreage. When the last previous sales were made in 1947, bonuses averaged over $20 per acre. Texas in the past leased 305,000 acres of submerged lands. That included 145,000 acres outside the three league limit which Congress has recognized as the state boundary.

Congress now is working on legislation to determine the status of such leases beyond the state limits. Within its three-league limit, Texas has leased 160,000 acres. That is only a small fraction of the 2,608,000 acres of submerged lands lying within its presently recognized boundary.

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NEWS ANALYSIS . . .

Need of Stronger Conservation Laws in Western States Cited

New conservation laws and the strengthening of existing regulatory measures are needed in the Western States.

Especially essential is the enactment of a conservation law for Utah, where oil production now exceeds 5000 barrels daily. So advised Forrest M. Darrough, Tulsa, general counsel of Carter Oil Company, addressing the Rocky Mountain Oil & Gas Association at Salt Lake City recently.

Some of those states, notably Wyoming, Colorado, Montana and North Dakota, he said, already have recognized the desirability of the conservation regulations and have enacted laws that encourage oil exploration and development. But experience will show a need for strengthening of conservation statutes already adopted, he added.

In Utah the industry spent millions of dollars in 1952 to find estimated new crude reserves of 23,630,000 barrels, Darrough stated. New regulatory legislation for the state is desirable, he said, because of the high cost of drilling and the lack of accessible transportation outlets, as well as the expensive special treatment required by some crudes.

"The people of Utah should support every reasonable effort to enact legislation to provide proper regulatory controls, in the hands of its own people, to protect its own resources," Darrough declared. "Utah's interests and those of industry are common—we must work together to protect the rights of all."

Proper spacing of wells is essential, he pointed out, to eliminate drilling of unnecessary and expensive wells. He added that when efficient operation of a field indicates unitization is necessary to obtain the greatest benefit to the state, the lessors and lessees, then unitization should be encouraged to prevent underground waste.

Since discovery of oil at Ashley Valley in 1948, Darrough said, the oil industry has spent many millions of dollars in Utah. He stated that he did not have figures for other companies but that to the end of last year, Carter had spent in exploration and development in Utah more than $14 million, with a total return to date on this investment of less than $750,000.

"In 1952, the total crude production in Utah was 1,730,000 barrels, just a few barrels short of the all time total production in the state through December, 1950," he declared. "This is indicative of Utah's expanding horizons. The daily average production for the state at year's end in 1952 was 5100 barrels. Eighty-three wells were drilled in Utah last year. Fifty-two were dry. Cost of drilling the 83 wells was approximately $8,500,000. Six million dollars represents the cost of the dry holes."

Western states, the speaker explained, have been in the mineral spotlight for a century. In Utah alone, he said, some 210 useful minerals are recovered commercially, adding "now petroleum is making its bid—helping to build for the future."

European Refineries Watched Closely

Over-expansion of European oil refining capacity by the end of 1954 is threatened. This possibility is seen in the third report of the U. S. agency (Organization for European Economic Cooperation) on coordination of oil refinery expansion in Europe.

European refiners plan to produce 86 million tons of finished products in 1954, and their total capacity at the end of 1954 probably will be about 99 million tons annually, according to the report.

"This is more than sufficient to meet the foreseeable needs of member countries at that time," stated OEEC. "Broadly speaking, Europe will no longer be dependent on imported supplies."

The estimate of a potential refining capacity of 99.5 million tons of all products annually as of Dec. 31, 1954, included 26.7 million tons of gasoline, 4.7 of kerosine, 20.4 of gas and diesel oil, 38.1 million tons of fuel oil, and 9.6 of other products.

New refineries under construction or planned at Aden and in Australia and India may reduce the markets for European refineries to the east of Suez, the report pointed out; and that market would be even more certainly curtailed, of course, if the big refinery at Abadan, Iran, were put back in operation. It is uncertain, according to the report, whether the European refineries could find market outlets elsewhere, in the event of the loss of the export business to the east of Suez. Resumption of operations at Abadan would hasten the time when the European plants might have trouble finding markets for all their output.

Any new refining capacity contemplated in Europe should have prospects of operating at reasonably economic levels, OEEC stated. And due consideration should be given to long-term as opposed to short-term outlets.

While Europe is approaching self sufficiency in production of refined products, it already has reached the point where nearly all the equipment required by European refineries can be manufactured in Europe itself, according to the OEEC report.

Wages Jumped

Wage and salary increases of 4 percent for oil industry employes had been put into effect extensively at the middle of July.

This increase was awarded quite generally to employes not represented by labor unions. It was offered at the same time to employes represented by the various unions. In some cases the unions approved the 4 percent raise. And it was indicated that this increase would be generally offered by oil companies and accepted by oil workers' unions throughout the country.

The 4 percent increase was made effective July 1 by numerous oil companies, and was applied at about the same time on the East Coast, the Gulf Coast, the West Coast and in the Middle West.

The oil companies evidently were more willing to make this offer following the increases in crude oil and product prices than they would have been under old price schedules.

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• U. S. Wells Completed in June and First Six Months, 1953

STATE or DISTRICT	NEW WELLS COMPLETED AND FOOTAGE DRILLED															Rigs in Operation		
	Oil	Dist.	Gas	Dry	Water Input	Gas Input	Water Disposal	TOTAL NEW WELLS June, 1953	TOTAL NEW WELLS May, 1953	TOTAL NEW WELLS June, 1952	Total Footage June, 1953	DETAILS FOR JANUARY-JUNE New Wells 1953	New Wells 1952	New Wells Percent Diff.	Footage 1953	Footage 1952	June 30, 1953	May 31, 1953	June 30, 1952
Alabama				10				10	7	7	47,412	49	28	+ 75.0	256,620	152,932	7	6	5
Arizona				1				1	1		5,368	5	1	+400.0	15,437	3,544	2	3	3
Arkansas	14			20				34	38	39	120,675	206	192	+ 7.3	733,858	708,097	40	28	41
California	188		4	62				254	200	212	1,089,008	1,299	1,269	+ 2.4	5,545,959	5,353,086	263	254	257
Colorado	22		12	36				70	52	36	341,648	288	193	+ 49.2	1,402,984	1,052,790	53	51	29
Florida				5				5	2		25,294	18	4	+350.0	95,165	27,224	5	6	1
Georgia												3			7,808		2	3	
Idaho				1				1			6,768	2			19,488				1
Illinois	72		1	96				169	175	201	485,579	883	852	+ 3.6	2,253,578	2,065,702	201	193	208
Indiana	36		1	59				96	94	122	162,810	585	583	+ 0.3	1,036,164	1,028,245	197	148	188
Kansas	164		34	143			7	348	448	387	1,190,284	2,357	2,181	+ 8.1	8,148,959	7,560,746	455	460	452
Kentucky	49		15	46				110	106	128	224,003	531	581	— 8.6	1,057,990	1,199,504	96	92	83
Louisiana	105	10	16	80				211	185	232	1,470,657	1,179	1,124	+ 4.9	8,450,474	7,649,127	233	228	215
North Louisiana	53	1	8	40				102	73	129	373,929	501	597	— 16.1	1,822,890	2,232,780	55	59	58
South Louisiana	52	9	8	40				109	112	103	1,096,728	678	527	+ 28.7	6,627,584	5,416,347	178	169	157
Maryland										3		2	23	— 91.3	8,198	91,829	3	4	19
Michigan	19		2	24				45	53	40	121,302	270	307	— 12.1	729,688	823,382	84	88	107
Mississippi	5	2	1	28				36	28	18	223,162	183	175	+ 4.6	1,256,545	1,258,551	40	32	35
Missouri	1							1	5	5	467	13	18	— 27.8	12,521	21,893	2	3	3
Montana	28			14				42	30	31	150,328	191	110	+ 73.6	857,315	327,147	67	49	61
Nebraska	21		3	18				42	25	15	224,447	164	88	+ 86.4	856,473	437,354	25	15	13
Nevada				1				1			3,158	6			9,050			2	
New Mexico	50		62	23				135	107	101	729,050	698	576	+ 21.2	3,933,340	3,098,020	204	177	188
New York	46				31			77	72	86	107,883	430	461	— 6.7	601,194	642,533	125	108	105
North Dakota	17			4				21	22	9	173,891	118	26	+353.8	937,795	242,678	28	34	19
Ohio	38		20	21				79	107	104	169,711	471	476	— 1.1	989,574	1,033,269	177	179	160
Oklahoma	341	2	39	200	3		2	587	710	545	1,928,323	3,487	2,891	+ 20.6	12,376,602	10,936,968	643	578	561
Pennsylvania	64		7	4	55	10		140	147	151	246,185	779	822	— 5.2	1,359,661	1,399,499	282	259	268
South Dakota				2				2	1		9,201	5	1	+400.0	25,499	8,433	5	4	3
Tennessee																			5
Texas	748	19	66	606	10		2	1,451	1,399	1,644	6,488,742	8,407	9,503	— 11.5	38,155,351	45,859,260	1,376	1,371	1,685
Dist. 1—South Central	44		1	39				84	76	66	272,929	420	356	+ 18.0	1,365,856	1,075,908	36	30	32
Dist. 2—Middle Gulf	23	5	15	31				74	67	68	444,575	401	429	— 6.5	2,449,315	2,679,908	48	46	59
Dist. 3—Upper Gulf	65	7	9	61				142	140	160	948,849	817	945	— 13.6	5,479,370	6,221,210	143	131	132
Dist. 4—Lower Gulf-S.W.	71	4	15	55				145	149	134	853,335	931	877	+ 6.2	5,318,985	4,509,594	110	114	101
Dist. 5—East Central	6	1		17				24	34	26	92,957	162	183	— 11.5	627,464	952,991	15	18	33
Dist. 6—Northeast	8		6	18				32	29	54	184,037	237	293	— 19.1	1,384,533	1,822,198	59	40	39
Dist. 7-B—North Central	124	1	3	141				269	254	284	898,913	1,542	1,461	+ 5.5	4,992,654	4,700,274	138	132	192
Dist. 7-C—West Central	67		2	39				108	114	185	477,735	705	1,160	— 39.2	3,474,329	6,845,120	117	138	269
Dist. 8—West	129	1	3	46				179	169	279	1,039,822	1,096	1,847	— 40.7	6,221,435	10,884,172	353	348	408
Dist. 9—North	191		1	154	10		2	358	338	303	1,164,316	1,863	1,609	+ 15.8	6,135,100	5,083,647	292	304	310
Dist. 10—Panhandle	20		11	5				36	29	85	111,274	233	343	— 32.1	706,340	1,084,238	65	70	110
Utah	3			7				10	5	1	62,062	42	24	+ 75.0	252,039	151,783	14	15	30
Washington																	1	1	
West Virginia	8		35	13				56	63	62	150,482	305	305		855,453	911,615	200	199	201
Wyoming	49			26				75	52	56	389,117	328	282	+ 16.3	1,637,676	1,455,572	105	103	91
Total United States	2,088	33	318	1,550	99	10	11	4,109	4,134	4,235	16,347,017	23,304	23,096	+ 0.9	93,878,488	95,500,783	4,935	4,693	5,037
Total Western Canada	68		7	68				143	92	168	606,996	832	816	+ 2.0	3,568,983	3,499,698	168	176	175

23,304 Completions at Mid-Year Tops Record 23,096 Set in '52

At Midyear, the U. S. oil industry had completed a total of 23,304 new wells to top the previous all-time first-half record of 23,096 drilled in 1952. The gain was only a little less than one percent, but from here on the margin will begin to widen in this year's favor, for it was at this time last year that the industry began to feel the steel strike's crippling effects.

There is nothing in the foreseeable future to hinder drilling activity. In fact, the recent crude price increase should go a long way in encouraging additional drilling, making the last half-year a period of intense activity. A new all-time high drilling mark should emerge.

Despite the increase in the number of wells completed this year, the amount of footage drilled did not follow the same pattern. Actually, total footage declined from 95,500,783 to 93,878,488 feet, a drop of 1,622,295 feet or 1.7 percent.

On the average, each U. S. well drilled this year was 107 feet shallower than last year's tests. Wells completed in the first six months of this year were 4028 feet deep, while last year's were 4135 feet on the average.

Of the top five drilling states, only one had a drilling decline during the first half, and that one was Texas, the leader. A slight decrease on the Gulf Coast and a much heavier drop in West Texas were responsible for the state's slipping. Wells dropped from 9503 last year to 8407, a loss of 11.5 percent.

The Number 2 state, Oklahoma, fared somewhat better statistically, when 3487 wells showed a gain of 20.6 percent over last year's 2891. Kansas was next in line with an increase of 8.1 percent; its wells going from 2181 to 2357.

California managed to hold its activity up by a scant margin, and recorded 1299 completed wells for a hike of 2.4 percent over its earlier record of 1269. Louisiana boosted its operations from 1124 to 1179, for a 4.9 percent climb. The Gulf Coast section of that state accounted for the increase, even overcoming a substantial decline in the northern district.

All Rocky Mountain areas experienced sizeable drilling gains this year.

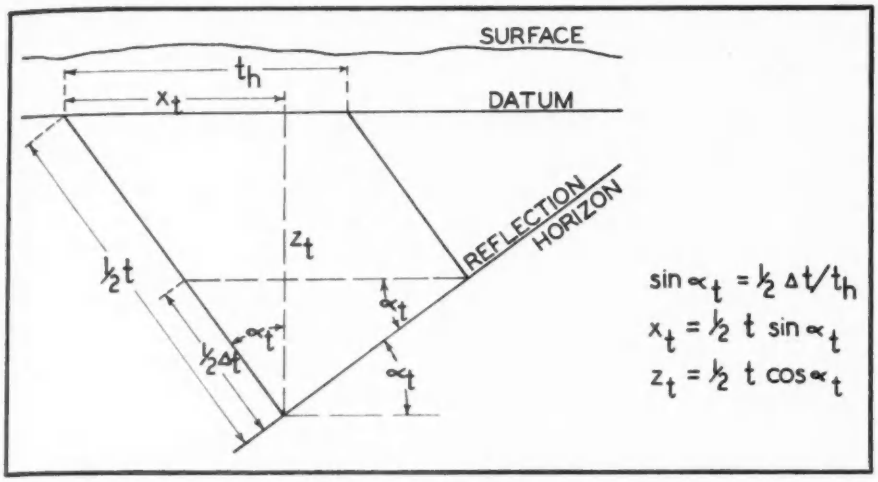

Fig. 1—Time Cross-Section.

New Seismic Computing Method Fast and Efficient

It allows use of any desired velocity function . . . and permits rapid change from one velocity curve to another.

By DR. R. B. RICE, Phillips Petroleum Company, Bartlesville, Okla.

A TIME-RESOLUTION method of performing reflection seismograph computations which is particularly useful in steep-dip areas has been developed and applied in the Mid-Continent area by Phillips Petroleum Company. Two of the principal advantages of the method are that it is simple and fast to use and that it allows the use of any desired velocity gradient or the rapid change from one velocity function to another. Except in special cases, the ray path produced by the method neither follows Snell's law nor is it a straight line. Nevertheless, the method appears to give good results.

The method essentially is based on the resolution of seismic data in time units rather than in distance units. This is the reason it has been called the "resolved-time" method. The basic notion of time resolution is certainly not new and has been used by most seismologists in some manner at one time or another. However, the refinements and extensions which have been developed in order to achieve a complete computing procedure for handling all types of reflection seismograph data are not common knowledge and may be of some interest. The basic analytic formulation of the method along with two examples of how it compares with the curved-path method may be found under the heading: "Mathematical Method No. 1" in an earlier paper by the author[1] but no attempt was made at that time to identify it as a time-resolution method or to present the details of its use.

Analytic Formulation of the Method. The principal assumption on which the method is based is that the ray paths as they appear on a time cross-section are straight lines and are normal to the reflection horizon on the time cross-section. It is this assumption, of course, which makes it possible to resolve the original time data graphically by means of a beam compass using the so-called "swinging arc" method. It should be noted here that the effect of the assumption on the results obtained depends on the type of time cross-section used.

To derive the basic formulas which describe the method, suppose we have given two two-way path times which

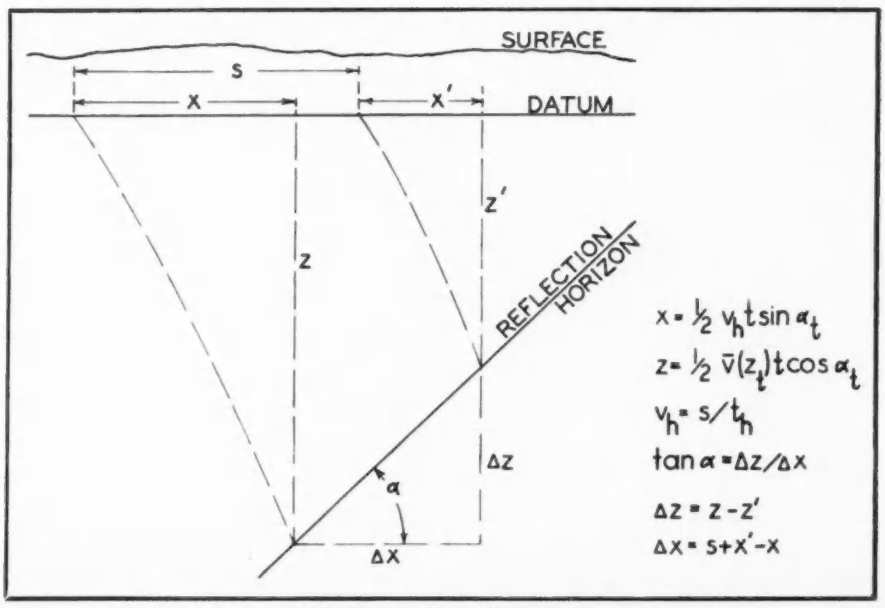

Fig. 2—Depth Cross-Section.

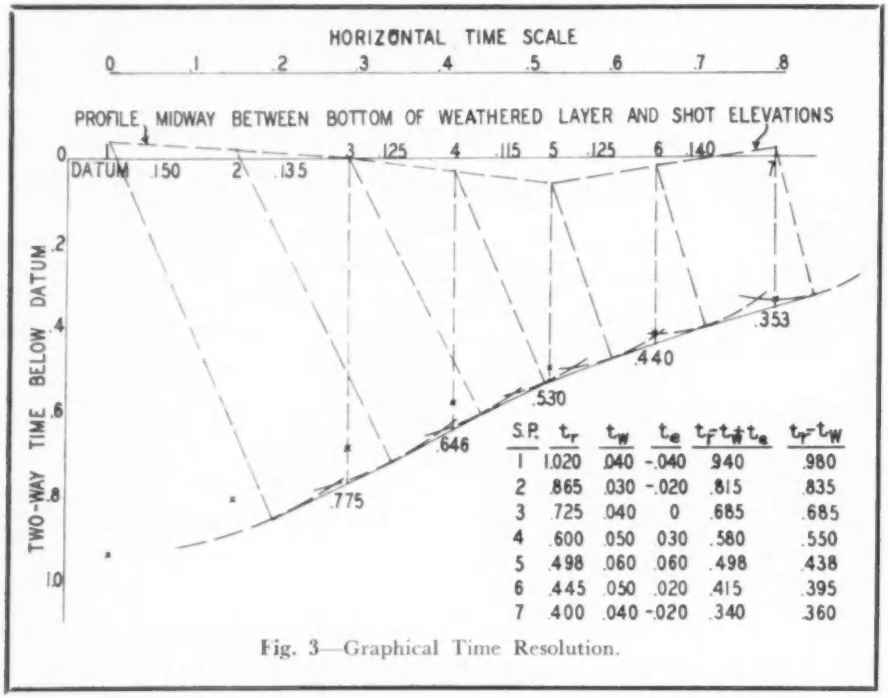

Fig. 3—Graphical Time Resolution.

have been corrected for weathering, angularity of path and elevation so that they are both referred to the same horizontal datum. (These corrections will be discussed later). Let t denote, say, the larger of these two-way times and Δt the two-way stepout time between them.

Now, in order to be able to plot these time-paths on a time cross-section, one must choose a time interval between the two time-paths along the datum. This horizontal time interval will be denoted by t_h. Then, on the basis of our assumption that, on the time cross-section, the time-paths are straight and normal to the reflection horizon (see Figure 1), we have

$$\sin \alpha_t = \tfrac{1}{2} \Delta t / t_h \quad (1)$$

$$x_t = \tfrac{1}{2} t \sin \alpha_t, \quad (2)$$

$$z_t = \tfrac{1}{2} t \cos \alpha_t, \quad (3)$$

where α_t is the angle of dip of the reflection horizon as it appears on the time cross-section and x_t, z_t represent the displacement (or offset) and depth of the reflection point R in time units.

To convert these time values to distance units, obviously they must be multiplied by a velocity factor. Let x_t be multiplied by a horizontal velocity factor, v_h, and z_t by the proper average vertical velocity, $\bar{v}(z_t)$ corresponding to z_t. We thus have

$$x = \tfrac{1}{2} v_h t \sin \alpha_t \quad (4)$$

$$z = \tfrac{1}{2} \bar{v}(z_t)\, t \cos \alpha_t \quad (5)$$

as the expressions for the horizontal displacement and depth of the reflection point.

The expression for the true angle of dip, α, corresponding to α_t may be readily found in terms of the horizontal displacements and depths of the points of reflections corresponding to two points on the datum which are a distance s feet apart. (See Figure 2). If these offsets and depths are denoted by x, x′ and z, z′, respectively, then it is evident from Figure 2 that α is given by

$$\tan \alpha = \Delta z / \Delta x \quad (6)$$

where

$$\Delta z = z - z' \quad (7)$$

and

$$\Delta x = s + x' - x. \quad (8)$$

The only quantities in the above formulas (1) through (8) which are not well defined are the horizontal time, t_h, and the horizontal velocity v_h. However, since it is obviously desirable for there to be a definite relation between the distance, s, between the paths along the datum on the depth cross-section and the corresponding time, t_h, on the time cross-section, we shall put

$$t_h = s/v_h. \quad (9)$$

Choice of v_h. Hence, the only question remaining is how to choose v_h. It is an important question, however, because through relation (9), α_t and hence x_t, z_t, x, z and α are all directly dependent on v_h. For a given t, Δt and s, α and x can be made relatively small and z relatively large by making v_h small, or α and x can be made large and z small by making v_h large.

It has been found that, as a general rule, the most satisfactory value for v_h is the refraction velocity just below the bottom of the weathered layer. A good approximation to this velocity is easily found by taking an arithmetic average of the two apparent velocities obtained from two-directional first-break time-distance plots. Note that this value of v_h is constant with respect to z_t, but *it is generally not constant laterally*. This lateral variation of v_h and the resulting variation of the horizontal times between shotpoints on the resolved-time cross-section has been found to be very helpful in obtaining a smooth and proper resolution of reflections.

The one exception to the use of the first-break refraction velocity for v_h is the case in which the first-arrival energy travels in a high-speed bed which has a much higher refraction velocity than underlying beds. In this case a value of v_h lower than this refraction velocity may have to be chosen in order to avoid obtaining horizontal displacements which are too large.

Graphical Procedure. The graphical method of carrying out the computations involved in equations (1) through (6) is very simple. The procedure consists of the preparation of three different cross-sections, which are referred to as the "raw-time" or "nonmigrated-time" section, the "resolved-time" or "migrated-time" section and the "depth" section. The raw-time and the resolved-time sections can be combined into a single cross-section if one so desires.

Raw-Time Section. The first step in the preparation of the raw-time section is to compute weathering times, t_w, corrections for angularity of

Fig. 4—Example 2—Raw-Time Section.

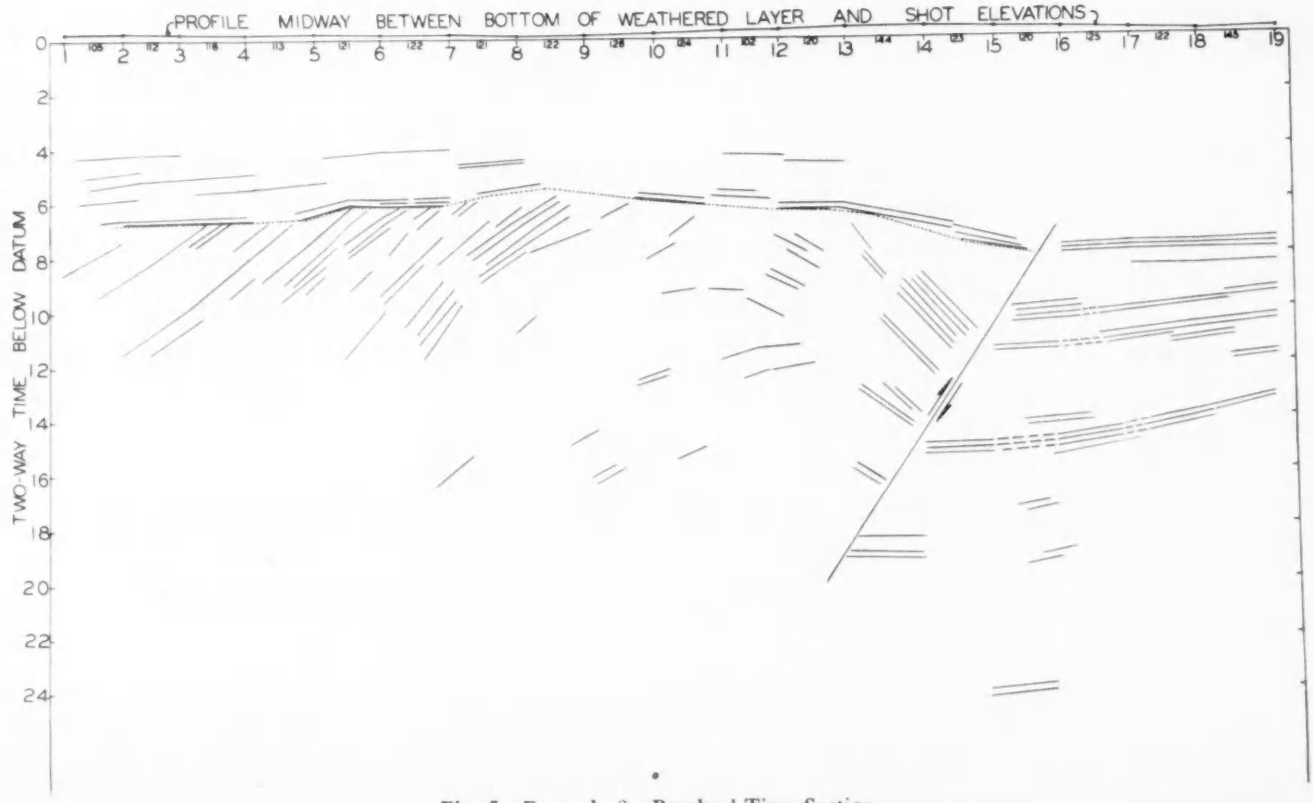

Fig. 5—Example 2—Resolved-Time Section.

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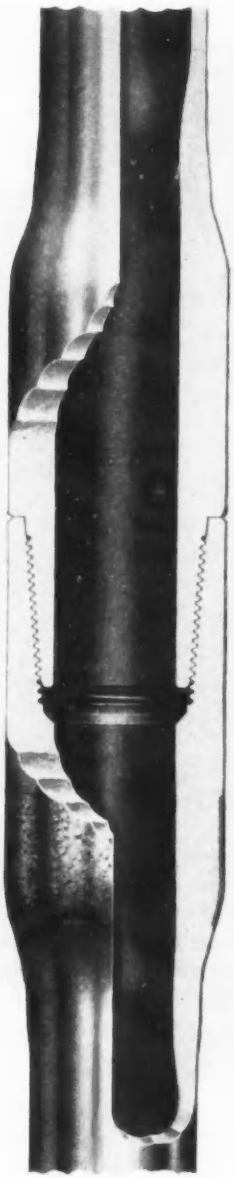

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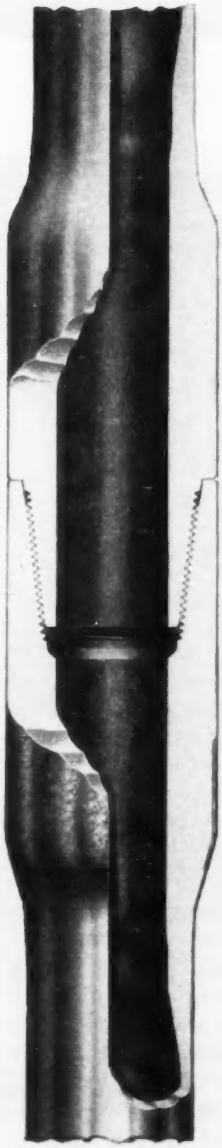

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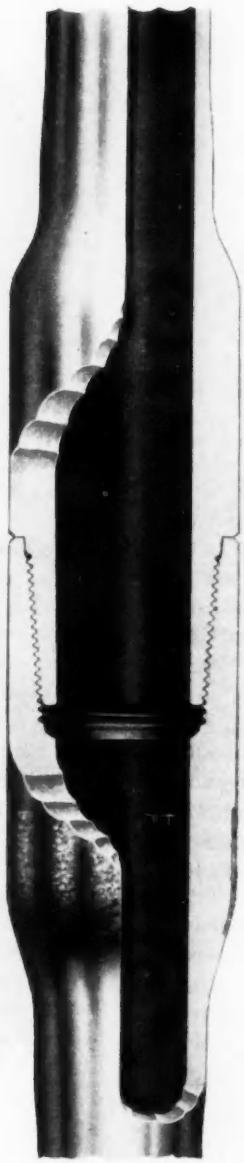

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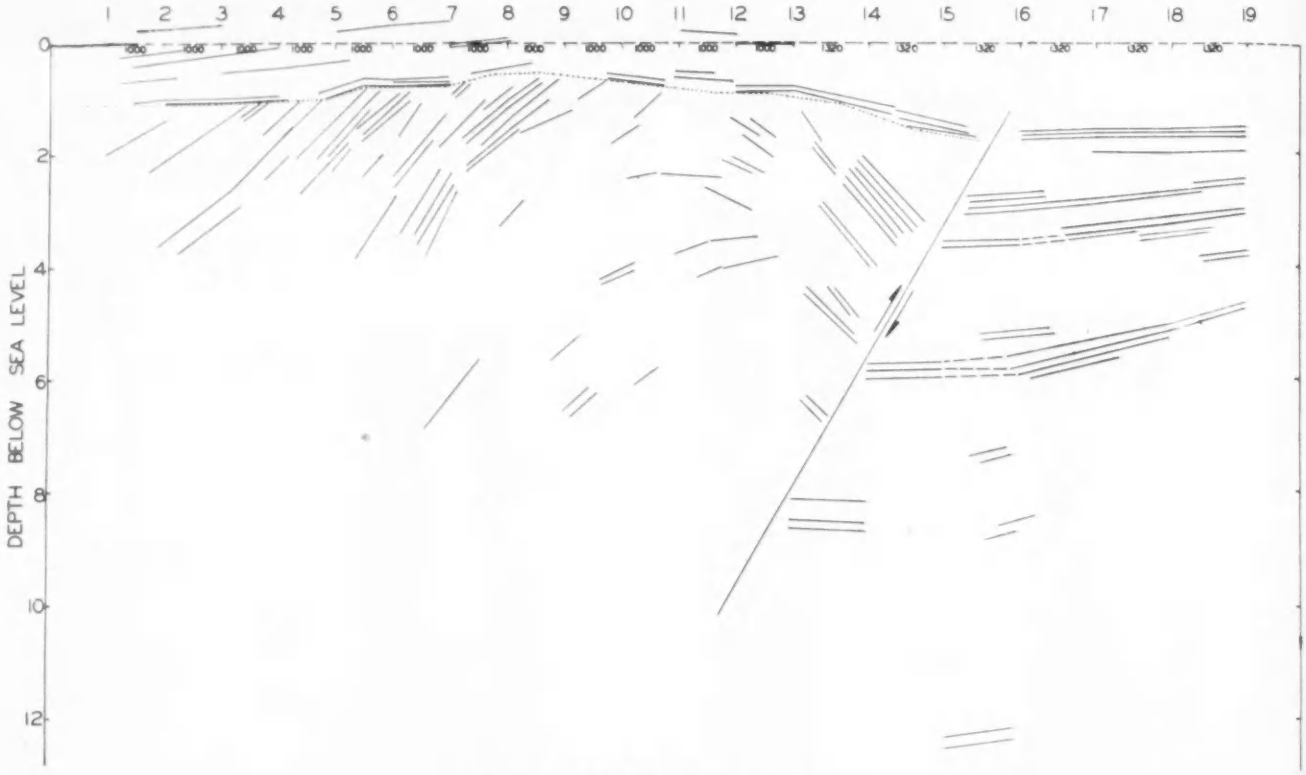

Fig. 6—Example 2—Depth Section.

path, if necessary, and elevation-correction times, t_e, in order to correct the original reflections times, t_r, to times, T, below some datum plane according to the formula

$$T = t_r - t_w + t_e. \qquad (7)$$

The only purpose of the datum in this case is to provide a convenient reference level for the vertical time scale; hence its location is not critical. It is more convenient, however, to place it at about the average level of the shots, so that the elevation correction times are kept as small as possible. Note that in formula (7) t_e is added algebraically to $t_r - t_w$, so that it is necessary to affix the proper sign to t_e. In this case, t_e will be negative if the datum is below the bottom of the weathered layer and positive otherwise. Note also that if the charge is fired above or below the bottom of the weathered layer, the time $t_r - t_w$ is approximately equal to a two-way time below the midpoint between the charge and the bottom of the weathered layer rather than a two-way time below the weathered layer. Thus t_e represents a two-way time between this midpoint and the datum.

Once the values of T are computed from (7), they are plotted vertically below the shotpoints to which they correspond, as shown by the crosses in Figure 3, which shows a combined raw-time and resolved-time section. If one is using other times besides near-phone times averaged across the shotpoint, then of course these values will be plotted below the midpoints between shotpoint and geophone. If one is making a separate raw-time section, then the shotpoint spacing is arbitrary. The main purpose of the raw-time section is to record the raw-time data in such a way that it can be visually checked for errors. For later reference in detecting plotting errors, values of T should be recorded at the end points of the reflections to which they apply.

Resolved-Time Section. On the resolved-time section, the shotpoints are spaced on the datum according to the horizontal refraction time, t_h between them. Then the two-way t_e values are plotted above or below these points on the datum according to whether they are negative or positive. This gives a time plot of the midpoints between the shots and the bottom of the weathered layer (See Figure 3). In order to keep the horizontal and vertical time scales the same and avoid dividing times, T, by two, the vertical time unit is made half the horizontal time unit.

Once these preliminary preparations are made, the time resolution is carried out as follows: Two-way times, T, below the datum are read from the raw-time section (if a separate raw-time section is used) and the pencil point of the beam compass is then set on this value below the shotpoint, or midpoint. The point end of the beam compass is then set on the shotpoint or midpoint on the profile midway between the bottom of the weathered layer and the charge (not on the datum). The spacing of the two points on the beam compass represents the two-way reflection time corrected only for weathering (and perhaps angularity of path):

$$t = t_r - t_w. \qquad (8)$$

Using this spacing as a radius, an arc is swung. The process is repeated for the corresponding t value below the adjacent shotpoint or midpoint and a portion of the reflection horizon is then drawn as a straight line segment which is tangent to the two arcs and equal to the distance between the two points of tangency. For a straight reflection horizon, the length of this line segment will represent the exact amount of coverage of the reflection horizon obtained from the spread between the two points on the surface. If the reflection horizon is concave

Continued on Page 104

JACKKNIFE RIG being erected in Escambia County in December, 1952. The well was completed as a dry hole.

Northwestern Florida... A New Oil Province?

The prospects look good. Alabama discovery indicates continuing trend. The area is close to ports. Activity is increasing.

By E. G. JEFFREYS, Consultant, Pensacola, Fla.

ONE OF THE MOST actively leased and highly regarded areas in Southeastern U. S. during 1952-53 has been the panhandle of Florida as far east as the axis of the Decatur Arch. The origin of this interest was Humble Oil & Refining Company's Allen Moye 1, which in January, 1952, discovered the Pollard field production in southern Escambia County, Alabama, only four miles from the Alabama-Florida state line.

Now, the entire panhandle area is undergoing its first intensive evaluation by major company and independent alike, and despite the many new problems which present difficulties in exploration, new techniques are being developed and old and new information is being carefully correlated to establish a better framework for future activity. Although seven wildcats completed in northwest Florida during 1952 discovered no new fields, this activity probably will be more than trebled during 1953, and it is hoped that with it will come the first oil or gas field to justify the efforts and faith of those who have pioneered for oil in the Florida panhandle since the turn of the century.

The most important factors in the current development are:

- That Pollard field indicated that the trend of Eutaw-Tuscaloosa production can and probably does extend throughout northwestern Florida.
- That oil discovered in this area will be available to ports which are the gateway to world markets.

This, naturally, has stimulated every company and operator with the vision to appreciate the significance of these facts.

Review of 1952-53. As may be seen from Table 1, eight wells were commenced in 1952 in search of oil or gas; of these, seven were drilled by independent operators and six had support from major companies. The most active wildcat operator was J. E. "Tye" Treadway, of the Sunnyland Contracting Company, Rayne, La., who also operates three rambler-type rigs in and around Pollard field. The eighth well was Humble's Franklin County well, which is still drilling at this writing, and is believed to be located on subsurface correlation as well as seismic information. It is considered by some to be a stratigraphic test, and results have not yet been released.

Only one well was drilled on core drill information, while the others were drilled on gravimetric and/or surface geologic indications, or for non-technical or other sundry reasons, and therefore it cannot be fairly stated that these wells properly evaluated any of the known structures throughout

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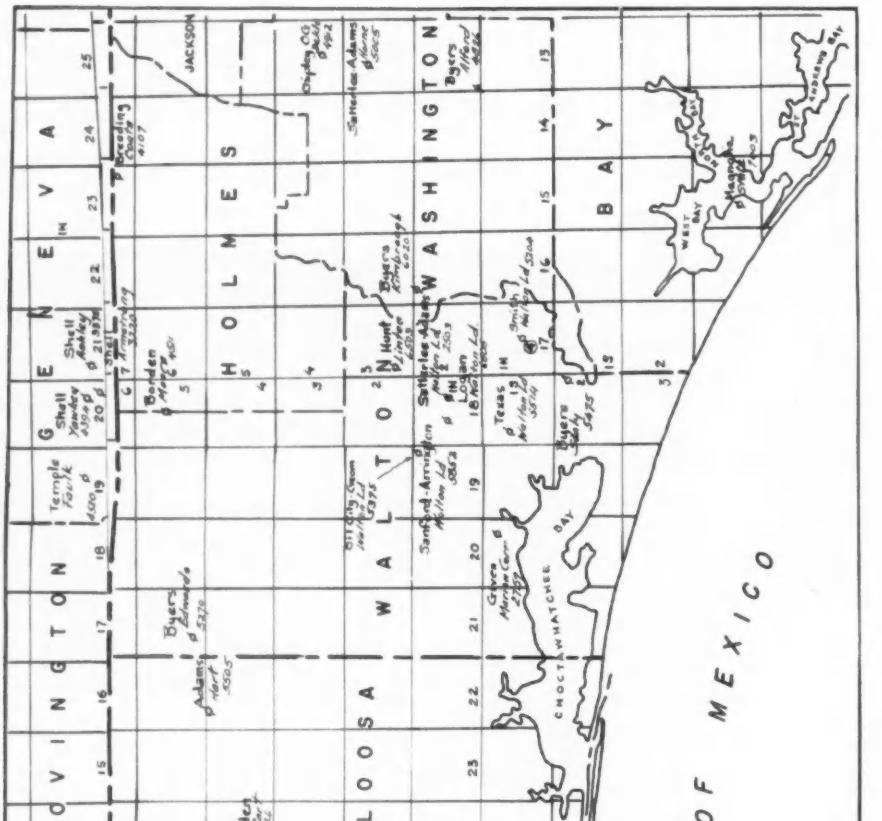
Location map of wells drilled in northwest Florida



the western counties. Some of these wells, at least, were close to structure, while others were quite normal, showing again that, unlike southern Mississippi, the local gravity anomalies here are frequently merely reflections of conditions in the basement rocks.

The appearance of dead oil in mud returns in the C. L. Smith Walton Land & Timber Company 1 from 4600 feet to total depth, aroused considerable interest, but sidewall cores based on the electric log failed to reveal the source of this oil and the well had to be plugged as a dry hole. This area southeast of DeFuniak Springs, in Walton County, has long been held as being potentially oil bearing, and there are definite indications of structure present. The California Company has most of this under lease, or option, at present.

The three wells drilled in Santa Rosa County were drilled near the town of Jay, seeming to indicate the existence of a rather complex fault pattern there, which is probably part of the generally en echelon strike-fault trend coming southeast out of Mississippi complicated by subsidiary contemporaneous, or earlier Appalachian northeast-southwest faulting.

In 1951 only three wildcat wells were drilled in the entire state of Florida. In 1952, eight wells were commenced in the panhandle alone, and geophysical and core drill activity, as compared to 1951 statistics, (reported in the June, 1952, issue of the *AAPG Bulletin*), was up over 1000 percent, with 486½ crew weeks of seismic and core drill work completed, compared to 46 crew weeks the previous year.

Factors relating to development —The role of large leases. Large leasehold interests play an important role in northwest Florida. These large holdings come under the following general categories: (1) government forest reserves, (2) military reservations, (3) large timber companies, (4) the tidelands, and (5) the river bottoms, internal improvement fund lands and other state lands. Considering each separately, we note that these large interests have been mostly leased by the major companies, with Gulf, Humble, California, Sinclair, British-American, and Commonwealth Oil Company, leading the field in acreage holdings.

Most of the government forest reservation land in Santa Rosa and Okaloosa counties is held by California Company. They are unitizing these leases, with a view to drilling some of their best seismograph pictures during the coming year. They have four

wells scheduled for their first two units, now complete.

The U. S. government military reservations, such as Eglin airfield, are not at present under lease. Since most of these reservations are along the coast, they are outside of the trend currently being developed.

So far, the large timber companies have been slow to lease, due to taxes and other related factors. St. Regis Paper Company alone represents one quarter million acres of unleased land, mostly in Escambia and Santa Rosa counties. They can play an important role in future activity in this area.

The tidelands have been leased to Commonwealth Oil Company, which has, in turn, transferred them to Gulf Oil Corporation. Gulf is at present seismographing the offshore waters, where they are reportedly getting very excellent records.

The river bottoms were leased to Humble early last year. Most Internal Improvement Fund and state-owned minerals, which are widely scattered, are still unleased.

In Mississippi, the right of the state to own mineral rights under highway right-of-ways was finally adjudicated to be controlled by certain state constitutional provisions, which provided that the state could only use the right of eminent domain to take what was absolutely necessary for the purposes set out by the condemnation and therefore these right-of-ways were held to be merely easements. In Florida, however, no test case has been tried, and the quit claim deeds taken by the state for highway right-of-ways still remain as a cloud on any lease embracing a section of highway or similar traffic conveyance.

Causes and remedies of difficulties encountered in exploration gravimeter, seismic, core drilling and surface geology. As mentioned before, gravimetric information has been seriously influenced by changes in the basement rock. These variations in attitude, depth and density are reflected as local gravity anomalies, which have in several instances been drilled and in almost all instances proved to be either apparently normal wells or wells having only very slight evidences of structure.

The main cause of inaccuracy in reflection seismograph work being done in northwestern Florida is the existence of high velocity beds at the surface, or just below the weathered zone. The velocity characteristics of these beds are transitional laterally and permit errors of large magnitude to enter into depth computations when no accurate velocity information is available. To date, not enough wells have been drilled in most areas to make it possible to obtain accurate velocity information. This condition will, of course, be remedied as more wells are drilled.

New techniques for obtaining better seismograph records now being developed by several geophysical companies may bring about economical and practical use of this exploration method for discovering hitherto unmapped structures.

Core drilling based on geophysics, to a depth sufficient to encounter the Salt Mountain lime of the Eocene Wilcox or some other reliable marker bed or horizon, has proved to be the most accurate way of mapping the Upper Cretaceous structure in northwest Florida.

Surface geology is generally unreliable due to unconformities which exist between the surface formations and producing horizons. Many times, false dips are indicated due to slumpage caused by solution of limestones near the surface. Late Pleistocene terrace deposits covering most of the area also make reliable outcrops few and far between. Only by doing extremely detailed work in the field can any semblance of reliability be credited to surface geologic information, and so far, very little of this has been done.

A few basic remedies to counteract some of the difficulties encountered in geophysical work here might be as follows:

(1) Gravimeter work should be cross-checked and used only as a reconnaissance tool to indicate areas which merit further investigation.

(2) Reflection seismograph should be tied in to velocity surveys, which should be run in all wells drilled in the future. Velocity contour maps might then be constructed from this information. All seismograph pictures should be cross-checked by different companies and/or methods and shot patterns.

(3) Core drill work should be used to substantiate information obtained by seismograph.

Causes and remedies of difficulties encountered in drilling. Lost circulation and cratering. The problem of lost circulation has been a definite factor to contend with in all wells drilled east of the dotted line shown on the map, and it becomes progressively more serious in the easterly direction. As the limestone outcrop is finally reached in the vicinity of the Apalachicola River, there is the additional hazard of cratering at the surface, due to underground caverns, with the attendant possibility of loss of equipment, as well as danger to personnel. Very little can be done to combat this first hazard, except to take adequate steps to minimize its

TABLE 1

Dry Exploratory Tests in Northwest Florida Area, 1952

Map Index	Operator	Farm	County	Basis for Location	Comp. Date	Remarks
0	Commonwealth-Perdido	No. 1 M. Lischkoff	Escam.	Gravity & unknown	12–13–51	Only well in northwest Fla., in 1951
1	Sunnyland Contracting Co.	No. 1 McMillan-Eubanks	Escam.	Gravity	5–20–52	Deepest well completed in 1952—7,006 feet.
*2	Sunnyland-LaRue	No. 1 C. Bynum	S. Rosa	Grav. & surf. geol.	6–18–52	Lost circ., low structurally
*3	Sunnyland	No. 1 E. Knowling	S. Rosa	Non-tech.	7– 5–52	Cut small fault. 6,665 feet Total Depth.
*4	C. L. Smith	No. 1 Walton Ld. & Tbr.	Walton	Unknown	7–27–52	Cut small fault appearance of dead oil on pit.
*5	Cecil R. Haden	No. 1 Y. F. McCart	Okaloosa	Gravity	10– 4–52	Lost circ.
6	Cashion-Scruggs	No. 1 H. Hanna	S. Rosa	Grav. & non-tech.	12– 6–52	Cut 160 ft. fault.
7	Humble O&R	No. 1 A. S. Mitchell	Franklin	Seis (?) & subsurf.	.....	Heavy circ. loss. Diamond coring large interval. Cost reputed to be over $175,000.
8	Fred LaRue	No. 1 L. A. Spencer	Jackson	Core drill	1– –53	TD: 4,115 ft. in L. Cretaceous.
*9	Sunnyland-G. Jeffreys & Sons	No. 1 J. A. Abbott	Escam.	Gravity	2– 2–53	Deepest well in NW Florida west of Jackson County. TD:7,512 feet. Commenced Dec. 31, 1952.

* Serviced by author.

danger. This includes setting sufficient surface casing and having the necessary jel-flake, sawdust, and other lost-circulation materials available while drilling. The danger of cratering can be minimized if desired by core drilling the location with a light rig to check for caverns, prior to spotting the heavy rig. Although this would be expensive, it might prove to be cheap insurance.

In the coastal region along the Gulf of Mexico, where relatively thick accumulations of recent and Pleistocene sand deposits occur, a string of surface casing sufficient to penetrate this is a pre-requisite to successful drilling. Provided care is taken to keep pump pressure low and drilling speed slow, using the jetting action of the mud to do most of the cutting, cratering of this loose surface sand usually will not occur before the surface casing is landed.

The role of the independent operator. The role of the independent operator in the current and future development of northwest Florida cannot be overemphasized. As may be seen by Table 1, all but one of the wells that were drilled in northwest Florida in 1952 were drilled by independents, and although 1953 will see increased activity on the part of the major companies, the favorable drilling cost throughout most of the western panhandle is a definite incentive to the small independent to promote drilling deals.

These wells, however, should by all means be drilled on sound geological and geophysical information and should not be predicated on, or biased by, the proximity of major company leases and the possibility of dry-hole money, for it is thought that the majority of fields to be discovered will be small in areal extent.

The major companies have displayed definite interest in having independent operators active throughout this area, and have shown willingness on all occasions to support any test having merit. Insofar as most of the wells that were drilled last year cost only a fraction of what wells in hard-rock country cost, they are relatively easy to finance and inexpensive to drill. (Between 8 and 13 rock bits will usually cut an average hole.)

The prospects for discovering oil in northwest Florida are considered to be excellent, and no valid reasons exist for thinking that the reservoirs of both Upper and Lower Cretaceous, as well as deeper horizons, will not be developed when more wells are drilled. To date, the Florida counties west of the Apalachicola River have had an average of seven wells each. Many of these tests are considered to have been poorly located as to structure. Therefore, little has been done to evaluate the merit of even the Upper Cretaceous. It is believed that there will be a high number of discovery wells in relation to the number of wells drilled, when more adequate control is established. —**The End**

About the Author

E. G. JEFFREYS, junior partner in the consulting partnership of G. Jeffreys & Son, has had most of his experience in Mississippi, Alabama and Florida. His oil field background began with the Petty Geophysical Engineering Company in Oklahoma in 1943. From 1944 to 1946 he was a member of the 289th Combat Engineers in Europe. After returning to civilian life in 1946, he entered the Colorado School of Mines, graduating with a degree in geological engineering. Varied employment up to this time included work with the Moore Cable Tool Drilling Company (Wyoming); the U. S. Department of Agriculture (Denver); assistant geology instructor at Colorado School of Mines' summer camp at Skull Creek, Colo., and surface geology and subsurface correlation (Mississippi). Since 1951 he has resided at Pensacola, Fla., where varied assignments have included core drilling and advisory consulting on many wildcat wells drilled in the northwestern part of the state during 1952.

New Computing Method

Continued from Page 98

downward, it will be too short, and if concave upward, it will be too long. These lengths can be adjusted, however, when the resolution of a complete reflection profile has been completed and the amount of curvature becomes evident. Figure 3 shows the inscribed arcs and their radii, which of course are not shown on a final resolved-time section, and the resulting reflection horizon. The time values used in this example are tabulated at the bottom right-hand corner of the figure.

The final step on the resolved-time section is to read the two-way vertical times between the datum and the reflection profile below each shotpoint or midpoint. It is desirable to record these times on the resolved-time section, as shown in Figure 3, for future reference. These vertical times are the ones to which the desired vertical velocity gradient is to be applied. It is evident that if the datum below which the velocity function applies is known to be different from the one being used, then some correction must be applied to correct for this difference. In practice, the two datums are usually made to coincide. However, if the datum below which the velocity function applies differs too much from the average level of the charges, it is probably better to compute a new velocity curve which does apply below the original datum at the average charge level than to correct all the vertical times.

Note that if one has sufficient justification for doing so, the vertical times can be corrected to a sloping datum or to a datum below which a regionally varying velocity gradient is assumed to apply, or they can be corrected to the bottom of the weathered layer. In short, the resolved-time method is completely flexible in allowing one to chose any velocity function (empirical or analytic), to assume that this velocity function applies below any desired datum and to vary the velocity function laterally if necessary. Furthermore, with the resolved-time section as a basis, one can go back at any time when additional vertical velocity information is obtained and easily and rapidly compute new depth values. This is probably the principal advantage of this method over other computing techniques.

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DEPTH SECTION. Preparation of the final depth section consists merely of plotting shotpoints according to the actual distance between them, converting the vertical times read from the resolved-time section to depth values by means of the desired velocity function, and plotting these depths below the proper points.

Example: In order to illustrate more fully the characteristics of these various cross-sections and to show how effective the resolved-time method is in resolving the data, cross-sections for an actual seismic profile have been prepared.

Figure 4 shows the raw-time section for this example. A considerable number of conflicting reflections will be noted in the right-hand portion of the section. The spread lengths are either 1000 or 1320 feet, and the horizontal velocities vary from 7940 to 11,000 feet per second. In this particular example, the shotpoints on this section have been spaced according to the distances between them rather than on the basis of the horizontal times.

Figure 5 shows the corresponding resolved-time section, with the reflections being resolved from the circled points along the profile midway between the bottom of the weathered layer and the shot elevations (the elevation-correction times in this case are all negative). Note how effective the resolved-time method is in clearly defining all the features of this section —the fault trace, the unconformity near the surface, and the overturn.

The resulting depth section is shown in Figure 6, with the depths being referred to sea level. —**The End**

REFERENCE

[1] R. B. Rice, "A Discussion of Steep-Dip Seismic Computing Methods, II," Geophysics, XV (January, 1950), 80-93.

ACKNOWLEDGMENT

The author is indebted to many people in the Research and Land and Geological departments of Phillips Petroleum Company for their help and cooperation during the various stages of development of this method, and in the preparation and approval of this paper for publication. In particular, he would like to express his appreciation to Ardris Haig, who was the first geophysicist in the company to use the basic elements of the method, to Dr. W. H. Courtier, who gave valuable criticism and help throughout its development and who is primarily responsible for its being tried in many different areas, and to the author's assistants, Mary Mikkelsen and Mary Mann, who performed most of the computations and drafted the slide-rule and figures.

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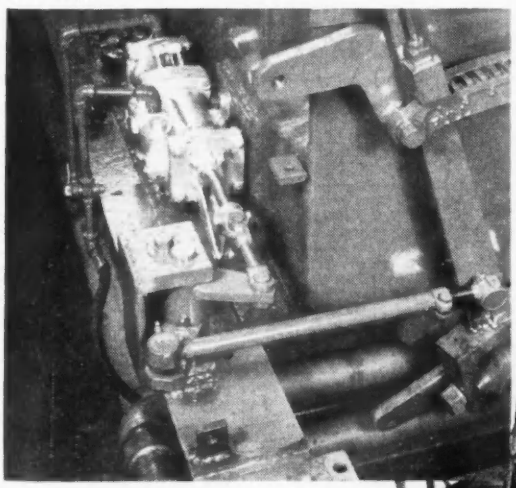

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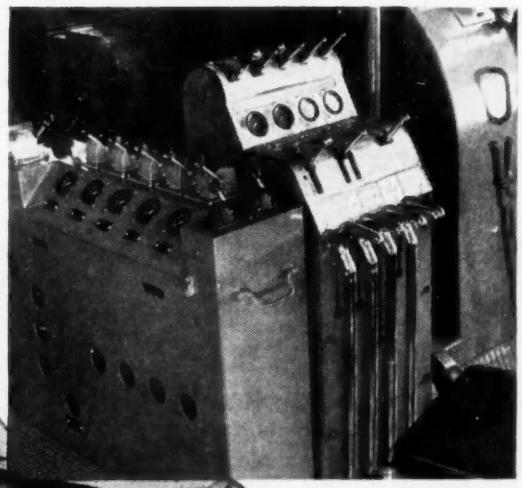

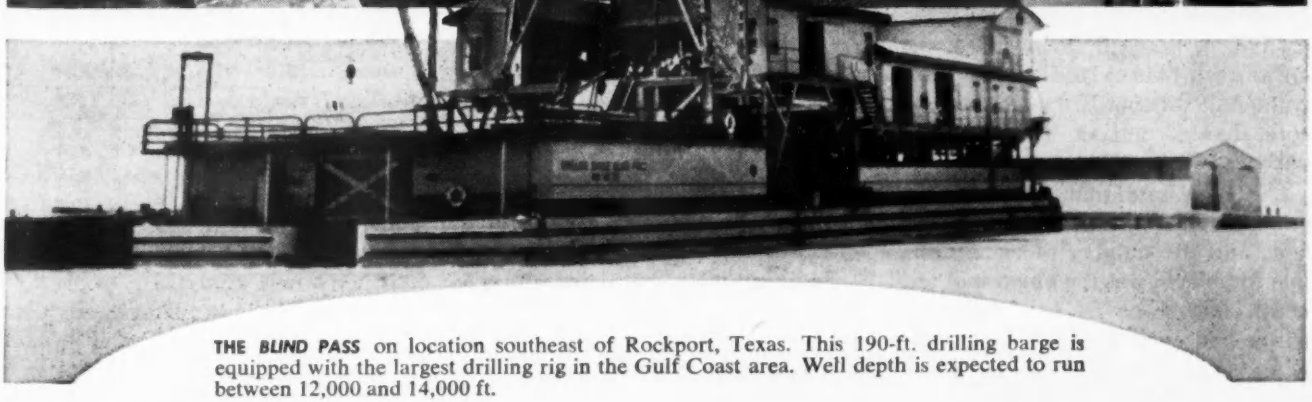

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	Productive Tests									Total Productive	Unproductive Tests			Total Exploratory Tests	Productive Tests								Total Productive	Unproductive Tests			Total Dry		Total Exploratory Tests	
	New Fields			New Pays			Extensions				Wildcats	New Pays	Outposts		New Fields			New Pays			Extensions									
	Oil	Dis.	Gas	Oil	Dis.	Gas	Oil	Dis.	Gas						Oil	Dis.	Gas	Oil	Gas	Dis.	Oil	Gas	Dis.	6 Mo. 1953	6 Mo. 1952	Wildcats	New Pays	Outposts	6 Mo. 1953	6 Mo. 1952	6 Mo. 1953	6 Mo. 1952
Alabama											9			9										2	35			35	17	35	19
Arizona											1			1											5			5	1	5	1
Arkansas	1			2						3	12			15	5		1	9						15	10	52			52	40	67	50
California	2		1	1			3			7	51		1	59	11		3	11		3	13		1	42	50	213		22	235	189	277	239
Colorado	4	1	1				1			7	26			33	11	1	9			1	2			24	18	137			137	81	161	99
Florida											5			5												18			18	4	18	4
Georgia																										3			3		3	
Idaho											1			1												2			2		2	
Illinois	4			2			5			11	47			58	8			9			17			34	43	205			205	245	239	288
Indiana	5						2			7	27			34	15		1	1		1	4			22	15	152			152	172	174	187
Kansas	10		3	1						14	69			83	74		14	3			3			94	71	449			449	415	543	486
Kentucky	2									2	7			9	12		1				2			15	17	50			50	59	65	76
Louisiana	1	3		6	2	2	2	2		18	31		1	50	12	9	1	23	7	3	7	4	1	67	52	176		3	179	166	246	218
North Louisiana	1	1		1			1			4	15		1	20	2	2		4	1		4			13	23	83		2	85	86	98	109
South Louisiana		2		5	2	2	1	2		14	16			30	10	7	1	19	6	3	3	4	1	54	29	93		1	94	80	148	109
Michigan	1		1				1			3	15			18	6		3				3			12	20	107			107	116	119	136
Mississippi	1									1	21		1	23	5	1	2	3	1		1	1		3	14	97		3	100	76	114	90
Missouri																										7			7	11	7	11
Montana	1						1			2	8			10	3		1				1			5	4	38			38	23	43	27
Nebraska	5		1				1		1	8	13			21	12		1				2		1	16	7	75			75	50	91	57
Nevada											1			1												6			6		6	
New Mexico	4		1							5	13			18	10		9	1			4		2	26	37	64			64	61	90	98
North Dakota							1			1	2			3	4						2			6	8	20			20	4	26	12
Ohio																					1		1	2	7	10			10	16	12	23
Oklahoma	8	1	1	3			6	1	2	22	57			79	54	4	14	18		1	32	1	3	127	100	363			363	351	490	451
Pennsylvania																							1	1						2	1	2
South Dakota											2			2												5			5	1	5	1
Texas	48	6	10	22	3		10	4	1	104	359		12	475	252	38	49	121	19	15	69	12	11	586	509	2059		58	2117	2082	2703	2591
Dist. 1 S. Central	1		1							2	32		1	35	6	2	2	1	1		1	1		14	16	164		5	169	161	183	177
Dist. 2 Middle Gulf	3	2	2	1	1		1		1	11	21			32	10	7	6	6	2	1	1	1	2	36	50	142		2	144	142	180	192
Dist. 3 Upper Gulf	2		1	1	1		1	3		9	35		9	53	13	5	3	23	10	6	7	7	5	79	72	179		36	215	170	294	242
Dist. 4 L.Gulf-S.W.	3	3	2	4	1					13	36			49	23	14	21	27	6	7	2	1	3	104	49	221		3	224	225	328	274
Dist. 5 E. Central											8			8	3	1	1	2						7	4	69			69	52	76	56
Dist. 6 Northeast	1									1	5			6	3	3		4						10	16	64			64	71	74	87
Dist. 7-B N. Cent.	15		2	7				1		25	86			111	83		11	20			13	1		128	103	473		1	474	484	602	587
Dist. 7-C W. Cent.	8		2	1						11	28			39	30	5	3	12			4			54	53	175		2	177	201	231	254
Dist. 8 West	7	1		2			1			11	30			41	39	1	1	7			18			64	62	170		2	172	195	236	257
Dist. 9 North	8			6			7			21	78		2	101	43		1	19		1	22	1	1	88	83	401		7	408	361	496	444
Dist. 10 Panhandle															1						1			2	1	1			1	20	3	21
Utah							1			1	4			5	3		1				1			5		25			25	19	30	19
West Virginia																									1				3		4
Wyoming	3			1						4	18			22	9			2						11	13	52			52	45	63	58
Total U.S.	100	11	19	38	5	2	34	7	4	220	799		15	1034	506	53	110	201	27	24	164	18	21	1124	998	4425		86	4511	4249	5635	5247

Exploratory Drilling Reaches New Peak at Mid-Year Mark

By **CECIL W. SMITH,** WORLD OIL Staff

THE MOST ACTIVE exploratory drilling campaign in history completed the first half of the year far ahead of the previous all-time record set in 1952. At the half-way mark, operations were more than 7 percent ahead of last year's record-breaking level.

The high rate that has been the order this year was continued during June, and the number of exploratory tests completed was the greatest of any month this year. In fact, only one month had ever recorded more completed wells and that was October, 1953, when activity that year reached a peak.

At the end of June, exploratory wells completed numbered 5,635 to top the 5,247 of last year by 7.4 percent. Of this year's, 1,124 proved to be producers to give the campaign a score of 19.9 percent successful. Last year's hunting yielded 998 successes for a score of 19.0 percent.

Resulting from that exploratory activity, was the opening of 707 new crude pools this year. Those were 506 new fields and 201 new pay strata in older fields. A year ago, new oil pools had totaled 643.

Eighty new distillate pools were added to the list. They were comprised of 53 new areas and 27 new pays in established fields.

Summary of Results of Exploratory Drilling

ITEM	June, 1953	May, 1953	SIX MONTHS January-June 1953	1952	Percent Diff.
Oil Discoveries	**138**	**116**	**707**	**643**	**+ 10.0**
New Fields	100	81	506	479	+ 5.6
New Pays	38	35	201	164	+ 22.6
Distillate Discoveries	**16**	**17**	**80**	**67**	**+ 19.4**
New Fields	11	8	53	59	— 10.2
New Pays	5	9	27	8	+237.5
Gas Discoveries	**21**	**30**	**134**	**101**	**+ 32.7**
New Fields	19	24	110	79	+ 39.2
New Pays	2	6	24	22	+ 9.1
Total Discoveries	**175**	**163**	**921**	**811**	**+ 13.6**
Extension to Fields	**45**	**49**	**203**	**187**	**+ 8.6**
Oil Fields	34	40	164	153	+ 7.2
Distillate Fields	7	5	18	6	+200.0
Gas Fields	4	4	21	28	— 25.0
Total Prod. Tests	**220**	**212**	**1,124**	**998**	**+ 12.6**
Dry Holes	**814**	**788**	**4,511**	**4,249**	**+ 6.2**
Wildcats	799	774	4,425	4,059	+ 9.0
New Pays				11	—100.0
Outposts	15	14	86	179	— 52.0
Total Expl'tory Tests	**1,034**	**1,000**	**5,635**	**5,247**	**+ 7.4**
Percent Productive	21.3	21.2	19.9	19.0	
Percent Dry	78.7	78.8	80.1	81.0	

U. S. Discoveries in June

NEW FIELDS, NEW PAYS AND EXTENSIONS

ARKANSAS—NEW OIL FIELD

Union County, Lisbon, North field. W. Phillips' Clemmie M. Bishop 1, C NE SE 25-16s-17w, pumped 109 barrels from Smackover lime, Jurassic 6398-6403 feet, 25.8-gravity, completed 6-14-53, TD 6403.

ARKANSAS—NEW OIL PAYS

Union County, El Dorado, East field. Smackover Producing Co.'s Paraffin-Ezzell 1, C NE NW NW 24-17s-15w, pumped 114 barrels from Tokio sand, Upper Cretaceous 2901-04 feet, completed 6-17-53, TD 3580.

Smackover field. R. M. Crabtree's Alphin 2, C NW SE NW 11-16s-15w, flowed 135 barrels from Travis Peak sand, Lower Cretaceous 3099-3104 feet, 14/64-inch, completed 6-7-53, TD 3164.

CALIFORNIA—NEW OIL FIELDS

Kern County. Ferguson & Bosworth's Fox O'Brien 42-A, in 31-29s-21e, pumped 9 barrels, 20-gravity, completed 6-19-53, TD 2520.

Unnamed field. Ferguson & Bosworth's Wallace-Hood-USL 1, NE NE 24-29s-20e, pumped 8 barrels oil and 40 barrels water from 490-533 feet, completed 6-3-53, TD 546.

CALIFORNIA—NEW OIL PAY

Orange County, Richfield field. Drilling & Exploration, Inc.'s Drilexco-State-Stern 1, NE SE 32-3s-9w, pumped 251 barrels from Lower Kraemer sand, 4645-4985 feet, 19.7-gravity, completed 6-4-53, TD 4985.

CALIFORNIA—OIL FIELD EXTENSIONS

Santa Barbara County, Cat Canyon field. Douglas Oil Co.'s Douglas-Fletcher 1-17-22, in 22-9n-33w, pumped 140 barrels from Sisquoc sand 3550-3800 feet, 24-gravity, completed 6-21-53, TD 3800.

Cat Canyon field. Slick Moorman Production Co.'s Palmer-Stendel 44-A, in 24-9n-33w, pumped 25 barrels from 2353-2533 and 2632-2704 feet, 17.9-gravity, completed 6-24-53, TD 2980.

Ventura County, Ventura Ave. field. Tide Water Associated Oil Co.'s Lloyd 173, in 27-3n-23w, flowed 925 barrels from D-8 sand 11,795-990 and 12,030-052 feet, 14/64-inch, 28-gravity, completed 5-31-53, TD 12,941.

CALIFORNIA—NEW GAS FIELD

Yolo County. The Ohio Oil Co.'s A. H. Rominger 1, NW SW 4-8n-1w, flowed 3.1 million from Cretaceous sand 3575-88 feet, 18-64-inch, completed 6-18-53, TD 3641.

COLORADO—NEW OIL FIELDS

Adams County. Forest Oil Co.'s State-Hugh 2, SW SE NE 36-1s-57w, flowed 110 barrels from "J" sand, Upper Cretaceous 5269-72 and 5291-94 feet, 41-gravity, completed 5-9-53, TD 5351.

Unnamed field. Triangle "J" Oil Co.'s Morris 1, NE NE SW 27-2s-57w, pumped 240 barrels from "D" sand, Upper Cretaceous 5396-5414 feet, completed 6-19-53, TD 5445.

Logan County, Graylin, Northwest field. British American Oil Producing Co.'s Monroe-Kieke 1, SW NE SE 1-8n-54w, pumped 83 barrels from "J" sand, Upper Cretaceous 5077-83 feet, completed 6-12-53, TD 5140.

Unnamed field. Falcon Seaboard & Allied Materials Corp.'s Thompson 2, SE SE SE 7-8n-54w, flowed 276 barrels from "J" sand, Upper Cretaceous 5421-27 feet, 24/64-inch, completed 6-22-53, TD 5500.

COLORADO—OIL FIELD EXTENSION

Washington County, Little Beaver field. Bill Tomberlin's Hogsett 1, SE SE NW 30-1s-56w, northwest extension, flowed 624 barrels from "J" sand, Upper Cretaceous 5440-50 feet, ¼-inch, completed 6-29-53, TD 5600.

COLORADO—NEW DISTILLATE FIELD

Morgan County. Falcon-Seaboard's Snodgrass 1, in 20-1n-57w, flowed 30 barrels distillate and 3.5 million from "J" sand, Upper Cretaceous 5547-63 feet, completed 5-28-53, TD 5810.

COLORADO—NEW GAS FIELD

Logan Field. Skelly Oil Co.'s Frank Svacina 1, SW SW SW 18-8n-54w, flowed 2.7 million from "J" sand, Upper Cretaceous 5404-20 feet, completed 6-3-53, TD 5502.

ILLINOIS—NEW OIL FIELDS

Jasper County, Wakefield, North field. A. J. Slagter, Jr.'s C. Wilson 1, SE SE SE 5-5n-9e, pumped 283 barrels from McClosky lime, Mississippian 3107-13 feet, completed 6-9-53, TD 3122.

Marion County, Kinmundy, North field. The Texas Co.'s C. F. Garrett 1, NE SW NE 10-4n-3e, pumped 10 barrels oil and 18 barrels water from Bethel sand, Mississippian 2036-55 feet, completed 6-23-53, TD 2292.

Saline County, Raleigh field. George & Wrather's W. H. Lemons 1, SE SW NE 2-8s-6e, pumped 42 barrels oil and 20 barrels water from Aux Vases sand, Mississippian 2906-12 feet, completed 6-23-53, TD 3101.

Washington County, Irvington, North field. D. Hopkins' J. Nolting 1, SE SE NW 34-1n-1w, pumped 51 barrels from Bethel sand, Mississippian 1482-85 feet, completed 6-16-53, TD 1485.

ILLINOIS—NEW OIL PAYS

Gallatin County, Omaha, South field. D. Rotstein's C. Woolard 3, NW SE NW 7-8s-8e, old well worked over, pumped 10 barrels oil and 30 barrels water from Cypress sand, Mississippian 2533-47 feet, completed 6-30-53, TD 2986.

Saline County, Releigh field. Dee Miller Drilling Co.'s Spurlock 1, NE NE SW 2-8s-6e, pumped 13 barrels from Cypress sand, Mississippian 2571-86 feet, completed 6-30-53, TD 3086.

ILLINOIS—OIL FIELD EXTENSIONS

Clinton County, Carlyle, North field. B. W. Hess' McQuade Community 1-A, SE SE 10-3n-3w, ½-mile extension, pumped 12 barrels from Bethel sand, Mississippian 1080-82 feet, completed 6-9-53, TD 1083.

Hamilton County, Flannigan field. Stewart Oil's N. Culpepper 1, NE SW SE 29-6s-5e, ½-mile extension, pumped 20 barrels oil and 19 barrels water from Aux Vases sand, Mississippian 3254-75 feet, completed 6-23-53, TD 3278.

Jasper County, Clay City Consolidated field. Cullum & Lawhead's B. Mattingly 1, NE NE SE 31-6n-10e, old well worked over, ½-mile extension, pumped 35 barrels oil and 16 barrels water from Aux Vases sand, Mississippian 2765-70 and 2772-89 feet, completed 6-9-53, TD 2968.

Wayne County, Johnsonville Consolidated field. Miami Operating Co.'s B. Butcher 1, NW NW SW 20-1s-6e, ½-mile extension, pumped 98 barrels from McClosky lime, Mississippian 3154-63 feet, completed 6-23-53, TD 3163.

White County, Epworth Consolidated field. Herndon Drilling Co.'s T. S. Land 1, SW SE SE 25-5s-9e, ¾-mile west extension, pumped 45 barrels from Rosiclare lime, Mississippian 3109-14 feet, completed 6-30-53, TD 3115.

INDIANA—NEW OIL FIELDS

Clay County. Carter's George & Hattie Lehner 1, NW NW SE 15-12n-7w, pumped 24 barrels oil and 12 barrels water from Devonian 1424-28 feet, completed 6-10-53, TD 1620.

Gibson County. D. & M. Oil Co.'s Lawson Newkirk 1, SE SW NW 32-2s-8w, pumped 8 barrels from O'Hara lime, Mississippian 1590-1610 feet, TD 1610.

Pike County, Noxid field. M. W. Brewer et al's Oscar Kinsman & Ed Lemons 1, NW NW NE 36-1s-7w, pumped 12 barrels from Aux Vases lime, Mississippian 1227-30 feet, completed 6-3-53, TD 1230.

Spencer County, Africa Enterprise field. J. Millard Haynes & Lin Horton's Ayer Brothers 1, SW SE NW 3-8s-6w, pumped 23 barrels from Tar Springs sand, Mississippian 982-990 feet, TD 997.

Lake Mills field. Oil Electronics, Inc.'s S. Q. Snyder & Allen G. Planes Unit 1, SW NW NE 7-7s-6w, pumped 15 barrels from O'Hara lime, Mississippian 1535-41 feet, TD 1541.

INDIANA—OIL FIELD EXTENSIONS

Gibson County, Princeton field. Francis Beard's William Rodgers 1, SW NE NE 24-2s-11w, ¾-mile extension, pumped 75 barrels from Cypress sand, Mississippian 1843-52 feet, TD 2211.

Posey County, Rapture field. Calvert Drilling's Al Johnson 1, SW SW SE 33-4s-13w, pumped 10 barrels oil and 15 barrels water from Waltersburg sand, Pennsylvanian 2130-35 feet, completed 6-24-53, TD 3056.

KANSAS—NEW OIL FIELDS

Barton County, Weikert field. Carl Boxberger's Weikert 1, SE SE SE 36-18s-

12w, pumped 266 barrels from Lansing lime, Pennsylvanian 3169-76 feet, TD 3452.

Unnamed field. Derby Oil & Pickrell Drilling Co.'s Feist 1, NW NE SW 26-18s-11w, pumped 130 barrels oil and 37 barrels water from Lansing lime, Pennsylvanian 3090-96 feet, TD 3327.

Cowley County. C. K. Gilliland's McEwen 1, SE NE SE 9-34s-8e, pumped 15 barrels from Mississippi lime, Mississippian 2351-85 feet, TD 2450.

Ellis County, Erbert field. National Cooperative Refinery Association's Erbert 1, NW NW NW 20-12s-20w, pumped 146 barrels from Lansing lime, Pennsylvanian 3727-34 feet, TD 3928.

Marion County. H. B. Ratzlaff et al's Groening 1, NE NW SW 16-19s-4e, pumped 30 barrels oil and 50 barrels water from Mississippi lime, Mississippian 2319-2400 feet, TD 2400.

McPherson County, Groveland field. Anschutz Drilling Co.'s Fleming 1, SE SE NE 10-20s-4w, pumped 157 barrels from Viola lime, Ordovician 3728-33 feet, TD 3802.

Nemaha County. O. O. Wallace & Fred Hewitt's Edelman 1, NW NW NW 26-2s-14e, pumped 25 barrels from Hunton lime, Devonian 2829-37 feet, TD 2851.

Pawnee County, Evers, Northeast field. Petroleum, Inc.'s Hauser 1, SW SE NE 31-21s-15w, flowed 48 barrels from Arbuckle lime, Ordovician 3915-18 feet, TD 3962.

Rooks County. G-M-R Oil Co.'s Williams 1, C N½ NE NW 6-10s-18w, pumped 180 barrels from Lansing lime, Pennsylvanian 3409-55 feet, TD 3760.

Stafford County, Radium Townsite field. Natural Gas & Oil Corp. & Sinclair's Estes 1, NE SE NW 5-22s-14w, potentialed 1921 barrels from Arbuckle lime, Ordovician 3850-63 feet, TD 3870.

KANSAS—NEW OIL PAY

Rooks County, Ganoung field. W. L. Hartman's Adams "A" 1, NE NE NW 31-9s-17w, pumped 214 barrels from Lansing lime, Pennsylvanian 3282-3557 feet, TD 3575.

KANSAS—NEW GAS FIELDS

Clark County, Harper Ranch field. United Producing et al's Harper 1, C NW SE 9-34s-21w, flowed 6.0 million from Morrow sand, Mississippi 5437-69 feet, TD 5566.

Unnamed field. I. W. Siegel's Theis 1, NE NE SW 18-34s-24w, flowed 9.8 million from Chester sand, Mississippian 5668-84 feet, open, TD 5830.

Morton County. Cities Service's Interstate A-1, SE SE NW 19-34s-43w, flowed 9.0 million from Morrow sand, Mississippian 4238-50 feet, open, TD 4715.

KENTUCKY—NEW OIL FIELDS

Daviess County. Shelby McIntosh & John Tuttle's M. E. Cravens 1, SW NE NW 21-N-28, pumped 24 barrels from Hadinsburg sand, Mississippian 1396-1412 feet, TD 1412.

McLean County. George S. Engle's Edna Jackson's 1, NE NE SE 15-N-25, pumped 12 barrels from Tar Springs sand, Mississippian 1734-46 feet, TD 1748.

NORTH LOUISIANA—NEW OIL FIELD

Grant Parish, Aloha field. Bates & Carnell's Walter Fletcher 1, C SW NE SW 9-7n-4w, flowed 56 barrels from Wilcox sand, Eocene 4290-4300 feet, 6/64-inch, 46.3-gravity, completed 6-15-53, TD 5565.

NORTH LOUISIANA—NEW OIL PAY

Webster Parish, Springhill field. John B. Stephens, Jr. & A. O. Phillips' Mattie Grafton 2, in 2-23n-11w, pumped 85 barrels oil and 56 barrels water from Pettit lime, Lower Cretaceous 5910-84 feet, 39.4-gravity, completed 6-18-53, TD 6189.

NORTH LOUISIANA—OIL FIELD EXTENSION

Concordia Parish, Esperance Point field. Justiss-Mears Oil Co. & Barnett Serio's Hugh Junkin et al 3, in 1-5n-9e, 1½-mile northwest extension, flowed 180 barrels from Campbell (Wilcox) sand, Eocene 6219-23 feet, 9/64-inch, 45.4-gravity, completed 6-7-53, TD 7009.

NORTH LOUISIANA—NEW DISTILLATE FIELD

Bossier Parish, Willow Chute field. Pan American Production Co.'s L. V. Hunt 1, in 5-19n-13w, flowed 22 barrels distillate and 3.0 million from Bodcaw sand, Jurassic 8316-30 feet, 16/64-inch, completed 6-8-53, TD 8369.

SOUTH LOUISIANA—NEW OIL PAYS

Cameron Parish, Cameron field. Stanolind's E. R. & C. F. Henry B-1, in 28-14s-9w, flowed 282 barrels from 9623-31 feet, 9/64-inch, 36-gravity, completed 6-19-53, TD 11,500.

Grand Lake field. The Texas Co.'s State-Mallard Bay 2, in 18-13s-3w, flowed 169 barrels from Miocene sand, Miocene 6092-6110 feet, ⅛-inch, 32.7-gravity, completed 6-23-53, TD 9205.

Iverville Parish, Bayou Des Glaise field. Humble's Baist Cooperage & Lumber Co., Inc. B-1, in 78-8s-8e, flowed 195 barrels from 11,332-344 feet, ⅛-inch, 34.3-gravity, completed 6-22-53, TD 11,410.

Plaquemines Parish, Southwest Pass field. The California Co.'s Plaquemines Oil & Development Co. et al 1, in 24s-31e, flowed 201 barrels from 8280-8310 feet, 10/64-inch, 31.7-gravity, completed 6-9-53, TD 10,993.

St. Landry Parish, Cankton, North field. Atlantic Refining Co.'s DeVillier 1, in 23-8s-3e, flowed 109 barrels from 8790-8800 feet, 7/64-inch, 36.8-gravity, completed 6-15-53, TD 9205.

SOUTH LOUISIANA—OIL FIELD EXTENSION

Terrebonne Parish, Bayou Penchant field. The Superior Oil Co.'s La Terre Co. 1-A, in 2-19s-13e, 1½-mile south extension, flowed 137 barrels from 11,616-621 feet, 8/64-inch, 39.6-gravity, completed 6-5-53, TD 14,434.

SOUTH LOUISIANA—NEW DISTILLATE FIELDS

Iberville Parish, Sullivans Lake field. Union Producing Co.'s Schwing 1, in 75-10s-11e, flowed 325 barrels distillate and 6.2 million from 10,984-11,004 feet, 5/16-inch, 49.9-gravity, completed 6-7-53, TD 11,182.

Vermillion Parish, Florence Area. Tide Water Associated Oil Co.'s Florence State 1-B, in 12-13s-2w, flowed 27 barrels distillate and 2.3 million from 11,812-817 feet, 12/64-inch, 49.0-gravity, completed 6-14-53, TD 11,888.

SOUTH LOUISIANA—NEW DISTILLATE PAYS

St. Landry Parish, Washington field. Sohio Petroleum Co. & Gulf Oil Co.'s Lionel Quirk 1, in 44-4s-4e, flowed 20 barrels distillate and 1.0 million from 9143-50 feet, ⅛-inch, completed 6-1-53, TD 9380.

Terrebonne Parish, Hollywood field. Tide Water's Southdown Sugars 1, in 101-17s-17e, flowed 151 barrels distillate and 5.7 million from 12,506-550 feet, 20/64-inch, 50.1-gravity, completed 6-21-53, TD 14,356.

SOUTH LOUISIANA—DISTILLATE FIELD EXTENSIONS

Calcasieu Parish, English Bayou field. The California Co.'s Albert Pujol 1, in 18-9s-7w, east extension, flowed 1.5 million from 10,628-642 and 10,646-673 feet, 10/64-inch, 45.2-gravity, completed 6-12-53, TD 10,900.

Lafourche Parish, Bourg field. Tide Water's Delta Securities Co. Inc. 1, in 35-17a-18e, north extension, flowed 96 barrels from 11,700-783 feet, 14/64-inch, 49-gravity, completed 3-12-53, TD 13,255.

SOUTH LOUISIANA—NEW GAS PAYS

Terrebonne Parish, Deer Island field. Union Producing Co.'s Continental Land & Fur. Co. B-2, in 26-18s-12e, flowed 36.0 million from 9833-88 feet, open, completed 6-7-53, TD 12,668.

Lake Hatch field. Union Oil Co. of California's Louisiana Land & Exploration B-7, in 4-18s-16e, flowed 1.5 million from 6548-58 feet, 9/64-inch, completed 6-15-53, TD 11,290.

MICHIGAN—NEW OIL FIELD

Montcalm County. William B. Darke's Webster 1, SE NW SW 22-10n-6w, Evergreen Township, pumped 15 barrels oil and 80 barrels water from Traverse lime, Devonian 2810-12 feet, TD 2812.

MICHIGAN—OIL FIELD EXTENSION

Clare County, North Hamilton field. Sun Oil Co.'s Coskey et al 1, NW NW SW 36-20n-4w, Frost Township, northwest extension, flowed 160 barrels from 5220-5327 feet, TD 5391.

MICHIGAN—NEW GAS FIELD

Necosta County. C. W. Collin & Granville C. Berlin's Mecosta Lakes et al 1, SW SW SE 17-14n-8w, Morton Township, flowed 4.8 million from 1320-26 feet, TD 3690.

MISSISSIPPI—NEW OIL FIELD

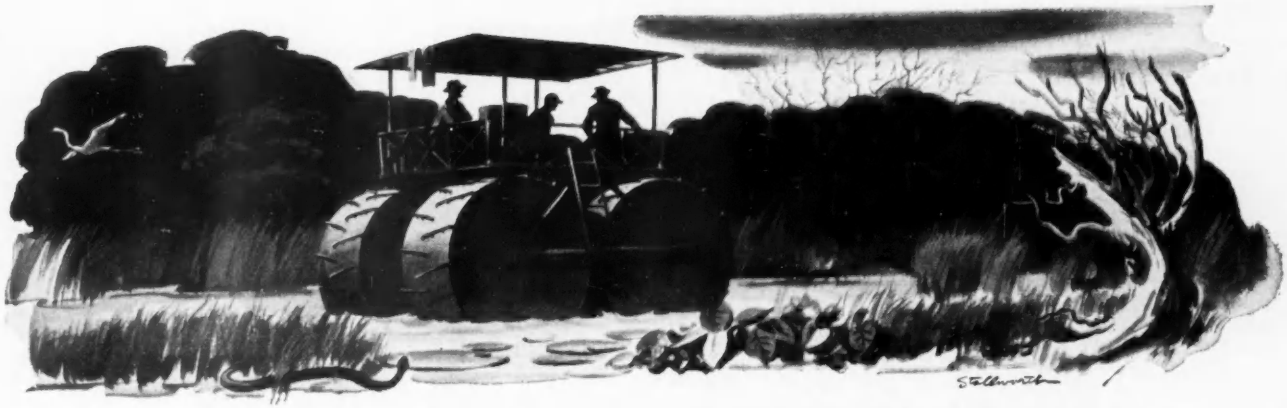
Wilkinson County, Saukum field. Gulf Refining Co.'s Crosby Lumber & Mfg. Co. et al 31, in 31-3n-1e, flowed 107 barrels from Wilcox sand, Eocene 7092-94 feet, 10/64-inch, 33.2-gravity, completed 6-12-53, TD 7700.

MONTANA—NEW OIL FIELD

Fallon County. Shell Oil Co.'s NPRR (Cabin Unit) 22-33, C NE SE 33-10n-58e, flowed 242 barrels from Ordovician 8688-8760, 8833-84 and 8912-57 feet, 12/64-inch, 30.8-gravity, completed 6-20-53, TD 9412.

MONTANA—OIL FIELD EXTENSION

Dawson County, Glendive field. Shell's Government 43-26, C NE SE 26-15n-54e, ½-mile north extension, flowed 329 barrels from Ordovician 8880-9104 feet, 11/64-inch, 37.5-gravity, completed 6-20-53, TD 9137.



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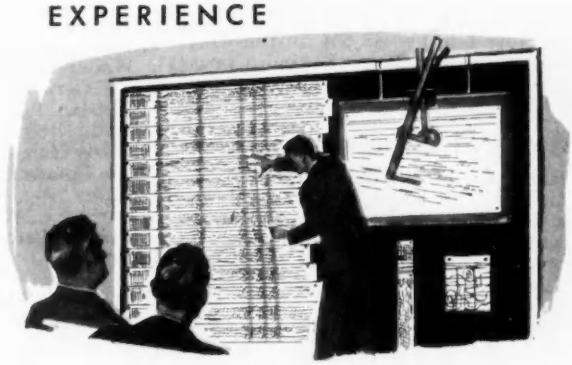

INTERPRETATION

For twenty-one years, SEI has specialized in sub-surface studies of the domestic oil provinces . . . from Canada to the Gulf. Numerous innovations in instrumentation, interpretation, and field technique have kept SEI in the forefront. For example, in difficult areas, SEI has been a pioneer in the use of patterns of multiple shot holes and geophone arrays.

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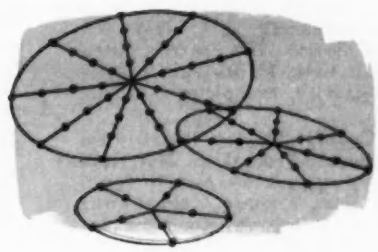

TECHNIQUE

SEISMIC EXPLORATIONS INCORPORATED

1007 SOUTH SHEPHERD • HOUSTON, TEXAS

DISCOVERIES . . .

NEBRASKA—NEW OIL FIELDS

Cheyenne County. Gaylord H. Chizum's McMillen et al 1, NE NE SW 34-14n-51w, pumped 360 barrels from "J" sand, Upper Cretaceous 5047-61 feet, completed 6-1-53, TD 5094.
Unnamed field. Ryan Oil Co.'s Schneel 1, SE SE NE 25-14n-49w, pumped 150 barrels from "D" sand, Upper Cretaceous 4379-4418 feet, completed 6-14-53, TD 4437.

Kimball County. Magnolia Petroleum Co.'s State 1, SW SW NW 16-12n-57w, pumped 141 barrels from "J" sand, Upper Cretaceous 6935-40 feet, completed 6-5-53, TD 7045.
Unnamed field. Rogers Oil Co. et al's State 1, NE NE NW 16-13n-54w, pumped 22 barrels from "J" sand, Upper Cretaceous 5588-92 feet, completed 4-30-53, TD 5826.
Unnamed field. Rogers Oil Co.'s Telken 1, C SE SW 8-12n-58w, pumped 18 barrels from "J" sand, Upper Cretaceuos 7358-64 and 7372-82 feet, completed 6-1-53, TD 7432.

NEBRASKA—OIL FIELD EXTENSION

Kimball County, Kimball field. Vaughey & Vaughey, Rogers Oil & E. J. Brock's Durland Trust 1, SW SW NE 15-14n-56w, 1-mile southwest extension, pumped 68 barrels from "J" sand, Upper Cretaceous 6560-69 and 6542-45 feet, completed 6-18-53, TD 6625.

NEBRASKA—NEW GAS FIELD

Cheyenne County. Ohio Oil Co.'s E. L. Uptegrove 1-B, SW SE SW 20-15n-49w, flowed 4.0 million from "J" sand, Upper Cretaceous 4652-4718 feet, completed 5-10-53, TD 4718.

NEBRASKA—GAS FIELD EXTENSION

Cheyenne County, Sidney, West field. Ohio Oil Co.'s Hill 1, SE NE NW 30-13n-50w, 1-mile south extension, flowed 3.5 million from "D" sand, Upper Cretaceous 4837-40 feet, completed 6-20-53, TD 5075.

NEW MEXICO—NEW OIL FIELDS

Lea County. Magnolia Petroleum Co.'s New Mexico 1-D, in 23-12s-32e, flowed 605 barrels from Permo-Penn lime 8456-80 feet, ¾-inch, 44.4-gravity, completed 5-21-53, TD 9029.
Unnamed field. Southern Union Gas Co.'s Parcell-Federal 1, C NW NE 19-21s-38e, flowed 288 barrels from Abo-Permian lime 7310-7492 feet, ¾-inch, 37.1-gravity, completed 6-11-53, TD 9208.

Rio Arriba County. Mission Petroleum Co.'s Stephenson-Federal 1, NW NW 22-26n-1e, pumped 35 barrels from Greenhorn lime, Upper Cretaceous 2953-61 feet, 40-gravity, completed 7-8-52, TD 3392.

Sandoval County. Lowry et al's Renkoff 1, SW NW NE 17-19n-4w, flowed 10 barrels from Mesaverde sand, Upper Cretaceous 2196-2212 feet, 39-gravity, completed 6-1-53, TD 4695.

NEW MEXICO—NEW GAS FIELD

San Juan County. El Paso Natural Gas Co.'s Martin 2, NE SE 34-30n-11w, flowed 1.6 million from Pictured Cliffs sand, Upper Cretaceous 2094-2148 feet, completed 6-23-53, TD 2148.

NORTH DAKOTA—OIL FIELD EXTENSION

Burke County, Tioga field. Warren Petroleum Corp.'s Carl J. Anderson 1, C SE SE 31-159n-94w, 1½-mile north extension, flowed 252 barrels oil and 85 barrels water from Madison lime, Mississippian 8110-30 feet, ¼-inch, completed 6-24-53, TD 8235.

OKLAHOMA—NEW OIL FIELDS

Atoka County. Hal H. Vaughn's W. W. Miller 2, NW NE NE 26-1n-14e, pumped 8 barrels from 484-520 feet, 36-gravity, TD 520.

Carter County, Brock, North field. State Oil Co.'s Riddle 1, NE SW SE 5-5s-1e, pumped 11 barrels from Deese sand, Pennsylvanian 1190-1200 feet, 35-gravity, TD 1792.

Cleveland County. Ohio Oil Co.'s Thomas Goodin 1, NE NW SW 34-9n-1e, pumped 60 barrels oil and 370 barrels water from 2nd Wilcox sand, Ordovician 6302-09 feet, TD 6367.

Lincoln County, Sunflower, Southeast field. E. L. Oliver's Overman 1, SW SW NE 23-14n-2e, flowed 85 barrels from Stray sand, Pennsylvanian 3796-3814 feet, 8/64-inch, TD 3861.
Unnamed field. Davidor & Davidor's Muzny 1, SW NW SW 25-13n-5e, pumped 40 barrels oil and 200 barrels water from Viola lime, Ordovician 4455-85 feet and from Simpson dolomite, Ordovician 4503-33 feet, 28-gravity, TD 4585.
Unnamed field. The Blackwell Oil & Gas Co. et al's Jacob Henson 1, SE SE NW 4-13n-3e, flowed 95 barrels from Lower Skinner sand, Pennsylvanian 4436-43 feet, ¼-inch, 38-gravity, TD 4443.

Logan County, Lockridge, East field. Walter Duncan & Anderson-Prichard Oil Corp.'s Jackson 1, NE NE SE 35-15n-4w, flowed 80 barrels from Prue sand, Pennsylvanian 6248-82 feet, 16/64-inch, TD 7217.

Noble County. Deep Rock Oil Corp's E. J. Miller A-1, NW SE NE 26-22n-1w, pumped 34 barrels from Mississippi lime, Mississippian 4765-71 feet, TD 5105.

OKLAHOMA—NEW OIL PAYS

Kay County, Banner field. Amerada's H. H. Hansen 1, SE SE SW 17-27n-2e, flowed 28 barrels oil and 20 barrels water from Mississippi lime, Mississippian 3758-70 feet, 41-gravity, TD 4106.

Lincoln County, East Parkland field. The Globe Oil & Refining Co.'s C. C. Efaw 1, C SW NW SW 29-16n-5e, flowed 101 barrels from Oswego sand, Pennsylvanian 3499-3531 feet, 24/64-inch, TD 3675.

Logan County, Novina, Southwest field. MacMillian Petroleum Corp.'s Berg 1, SW SW NW 14-15n-4w, flowed 114 barrels from Simpson dolomite, Ordovician 6430-65 feet, 22/64-inch, TD 6640.

OKLAHOMA—OIL FIELD EXTENSIONS

Carter County, Caddo field. Signal Oil & Gas Co.'s Herman Smith 1, SW SW NE 22-3s-1e, northwest extension, flowed 127 barrels from Woodford lime, Mississippian 4248-49 feet, 8/64-inch, 39.6-gravity, TD 4719.

Cleveland County, Clotheir, Southwest field. Carter's Hazel Hicks 1, NW NW SW 32-10n-2w, flowed 42 barrels from Viola lime, Ordovician 7176-7217 feet, ¼-inch, and flowed 138 barrels from Oil Creek lime, Ordovician 8065-73 feet, 3/8-inch TD 8102.

Coal County, Jessee field. Jay Simmons' J. M. Nix 1, NW NW NW 5-1n-8e, flowed 40 barrels from Cromwell sand, Pennsylvanian 3878-90 feet, 16/64-inch, 40-gravity, TD 3957.

Creek County, Jennings, Southwest field. Cy R. Foster's Rockwood-Witt 1, SW NE NE 4-19n-7e, flowed 96 barrels from Skinner sand, Pennsylvanian 2552-59 feet, ¼-inch, 37-gravity, TD 2768.

Jefferson County, Loco field. Hamilton & Cardin's C. H. Featherston 1, SW SE NE NE 22-3s-5w, pumped 4 barrels from 226-242 feet, 20-gravity, TD 242.

Lincoln County, Payson field. Sterling Oil of Okla., Inc.'s Frost 1, C SE NW NE 18-12n-5e, pumped 100 barrels from Lower Skinner sand, Pennsylvanian 4275-89 feet, 38-gravity, TD 4346.

OKLAHOMA—NEW DISTILLATE FIELD

Garfield County. Toklan Production Co.'s Blasser 1, SW SW NE 17-23n-4w, flowed 130 barrels distillate and 6.6 million from Mississippi lime, Mississippian 5462-83 feet, open, TD 6216.

OKLAHOMA—DISTILLATE FIELD EXTENSION

Garvin County, Erin Springs field. Goldsmith & Perkins' Coller 1, SW NE 24-4n-4w, 1¼-mile north extension, flowed 108 barrels distillate and 1.0 million from Hartshorne sand, Pennsylvanian 7823-54 feet, 10/64-inch, 60.6-gravity, TD 8047.

OKLAHOMA—NEW GAS FIELD

Washita County. Huffman & Malloy's Sophia Hanza 1, NW SW SE 33-8n-16w, flowed 2.7 million from Springer sand, Pennsylvanian 5696-5752 and 5994-6106 feet, ½-inch, TD 6507.

OKLAHOMA—GAS FIELD EXTENSIONS

Cimarron County. Terminal Facilities, Inc.'s Ferguson C-1, C SE SE NW 35-5n-9ecm, flowed 33.9 million from Keyes sand 4556-83 feet, TD 4689.

Kiowa County, Gotebo field. Woodward & Co.'s Harry Laufer 1, SE NE NE 3-7n-16w, ½-mile west extension, flowed 10.0 million from Springer sand, Pennsylvanian 5406-46 and 6084-6124 feet, TD 6393.

TEXAS DISTRICT 1—NEW OIL FIELD

Atascosa County. George W. Delker's Henry Schorsch 1, Natascosa Colony Farms Truck Subdivision 21, pumped 47 barrels from Queen City sand, Eocene 1537-39 feet, completed 5-27-53, TD 1549.

TEXAS DISTRICT 1—NEW GAS FIELD

Milam County. D. H. Byrd et al's Lucinda Greene 1, W. D. Thompson Survey, flowed 12.5 million from Upper Glenrose sand, Lower Cretaceous 6245-6313 feet and flowed 8.0 million from Upper Pettit sand, Lower Cretaceous 7682-7700 feet, open, completed 6-12-53, TD 8210.

TEXAS DISTRICT 2—NEW OIL FIELDS

Goliad County, Barvo field. Louish Haring, Jr. & Hawn Bros.' P. T. Calhoun 2, M. J. Y'Barbo Survey, flowed 49 barrels from Pettus sand, Eocene 4141-45

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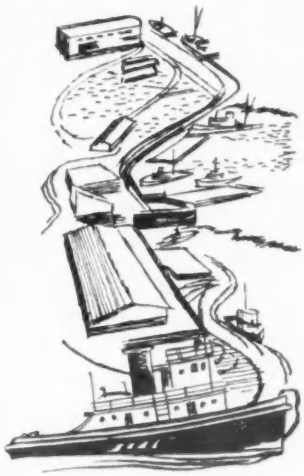

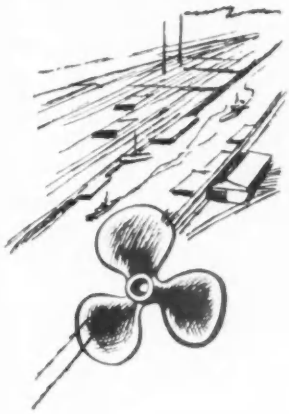

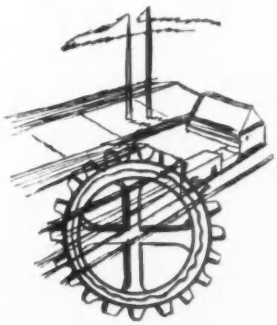

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feet, 7/64-inch, 47.6-gravity, completed 6-1-53, TD 4162.

Unnamed field. Carnes W. Weaver's Annie Ideus 1, Graviel Casias Survey, flowed 98 barrels oil and 10 barrels water from 7622-26 feet, ⅛-inch, completed 6-15-53, TD 7805.

Victoria County, Bessie Welder field. Arnold O. Morgan's B. H. Welder B-1, SA&MG Survey, Section 18, flowed 205 barrels from Wilcox A-1 sand, Eocene 8202-12 feet, 10/64-inch, 30-9-gravity, completed 6-11-53, TD 8355.

TEXAS DISTRICT 2—NEW OIL PAY

Jackson County, Ganado, East field. The Texas Co.'s V. J. Hlavinka 1, John Davis Survey, flowed 64 barrels from Lower Frio sand, Oligocene 6490-92 feet, 44-gravity, completed 6-16-53, TD 6800.

TEXAS DISTRICT 2—OIL FIELD EXTENSION

Goliad County, Barvo field. W. C. McBride's William H. Corgey 1, Maria de Jesus Y'Barbo Grant, ¾-mile east extension, flowed 40 barrels from Pettus sand, Eocene 4231-37 feet, 6/64-inch, 47-gravity, completed 6-30-53, TD 4270.

TEXAS DISTRICT 2—NEW DISTILLATE FIELDS

Calhoun County. The Chicago Corp.'s O. F. Hahn et al 1, James Lee Survey, old well worked over, flowed 50 barrels distillate and 1.5 million from 7347-80 feet, open, 60-gravity, completed 6-15-53, TD 9139.

Dewitt County. Kirkwood & Co.'s E. L. Boldt Estate 1, P. C. Ragsdale Survey, flowed 31 barrels distillate and 15.0 million from 7422-27 feet, open, 47.2-gravity, completed 6-26-53, TD 7615.

TEXAS DISTRICT 2—NEW DISTILLATE PAY

Goliad County. Morris Cannan, Frank W. Michaux & Creslenn Oil Co.'s Gladys Powell Key et al 1, William D. Sutherland Survey, flowed 1300 barrels distillate and 56.5 million from Luling sand, Lower Cretaceous 7558-63 feet, open, 54.2-gravity, completed 6-4-53, TD 7675.

TEXAS DISTRICT 2—NEW GAS FIELDS

Goliad County. 2nd M. E. Andrews Ltd. Dallas Husky's Jack Wilson 1, Noah G. Stebbins Survey, flowed 25.0 million from 3070-75 feet, open, completed 6-12-53, TD 3100.

Jackson County. N. B. Hunt's H. E. Mulholland et al 1, John M. White Survey, flowed 66.0 million from Frio sand, Oligocene 3722-26 feet, open, completed 5-2-53, TD 3807.

TEXAS DISTRICT 2—GAS FIELD EXTENSION

Jackson County. The Texas Co.'s F. L. Franek 1, I&GN RR Co. Survey, Block 2, Abstract 197, ½-mile northeast extension, flowed 6.5 million from Frio sand, Oligocene 3844-48 feet, open, completed 6-29-53, TD 5504.

TEXAS DISTRICT 3—NEW OIL FIELDS

Matagorda County. Roy R. Gardner's Mid Field Townsite Unit 1, I&GN Survey, Section 6, Block 8, flowed 163 barrels from Lower Frio sand, Oligocene 8801-15 feet, ⅛-inch, 51.9-gravity, completed 6-1-53, TD 8880.

Unnamed field. Skelly Oil Co.'s G. M. Savage 1, Maria Cummins Survey, flowed 160 barrels from Frio sand, Oligocene 8476-79 feet, ⅛-inch, 33.6-gravity, completed 6-18-53, TD 11,799.

TEXAS DISTRICT 3—NEW OIL PAY

Jefferson County, Big Hill, South Flank field. Stanolind's Henry Schmidt 1, Stephen Eaton Survey, flowed 204 barrels from Hackberry sand, Oligocene 9666-78 feet, 10/64-inch, 30.4-gravity, completed 6-23-53, TD 9830.

TEXAS DISTRICT 3—OIL FIELD EXTENSION

Orange County, Eco field. John W. Mecom's First National Bank in Orange Unit 1, in R. Ballew Survey, ½-mile northeast extension, flowed 242 barrels from Frio sand, Oligocene 8700-02 feet, 8/64-inch, 38.6-gravity, completed 5-26-53, TD 9360.

TEXAS DISTRICT 3—NEW DISTILLATE PAY

Wharton County, Hutchins, Southwest field. Progress Petroleum Co.'s P. J. Herrmann 1, I&GN RR Co. Survey, Section 13, flowed 20 barrels distillate and 0.9 million from Upper Frio sand, Oligocene 3947-52 feet, 11/64-inch, completed 5-10-53, TD 5800.

TEXAS DISTRICT 3—DISTILLATE FIELD EXTENSIONS

Brazoria County, Pledger field. Humble's Pledger Gas Unit 8-1, D. Shipman & I. N. Charles Survey, ½-mile north extension, flowed 5 barrels distillate and 0.5 million from Frio sand, Oligocene 6790-6838 feet, open, 54.2-gravity, completed 5-13-53, TD 6930.

Harris County, Katy field. Lee Brothers Oil Co.'s E. W. Peek 1, H&TC RR Co. Survey, Section 66, Block 2, ½-mile east extension, flowed 162 barrels distillate and 12.0 million from 3rd Yegua sand, Eocene 7109-11 feet, open, 55.6-gravity, completed 5-26-53, TD 7116.

Wharton County, Hutchins field. Progress Petroleum's Edith Hermann 1, G. W. Reynolds Survey, Section 2, 2/3-mile southwest extension, flowed 1370 barrels distillate and 62.0 million from Frio sand, Oligocene 5844-51 feet, open, 50.9-gravity, completed 6-7-53, TD 6018.

TEXAS DISTRICT 3—NEW GAS FIELD

Wharton County, Lane City field. Sohio's Susan L. Houston 1, S. Castleman Survey, flowed 32.3 million from Marginulina sand, Oligocene 5428-35 feet, open, completed 5-27-53, TD 7009.

TEXAS DISTRICT 4—NEW OIL FIELDS

San Patricio County, "Picha" field. Ben F. Vaughn Jr. & F. P. Zoch, Jr.'s J. J. Picha 1, G. H. Paul Subdivision Coleman Fulton Pasture Co. Land, Section 54, flowed 162 barrels from 7300-02 feet, ⅛-inch, 42.5-gravity, completed 6-3-53, TD 7900.

Unnamed field. Big Six Drilling Co.'s Thos. Dix 1, Pauls Subdivision J. J. Welder Ranch, Section 32, flowed 69 barrels from 5010-18 feet, ⅛-inch, 39.7-gravity, completed 6-2-53, TD 6216.

Starr County. Owen & Moss' D. S. Ricaby Estate 3, Moss & Heard Subdivision, Block 17, flowed 10 barrels from Frio sand, Oligocene 1679-85 feet, ⅛-inch, 26-gravity, completed 6-10-53, TD 2810.

TEXAS DISTRICT 4—NEW OIL PAYS

Aransas County, Fulton Beach North Seg. "A" field. C. G. Glassock & Humble's State Tract 11-2, Copano Bay, flowed 119 barrels from 6756-61 feet, 7/64-inch, 42.3-gravity, completed 6-2-53, TD 7296.

Hidalgo County, Tabasco field. Houston Oil & American Republics Corp.'s Temple W. West 16, Porcion 74, flowed 40 barrels from Mission sand, Oligocene 5766-70 feet, ⅛-inch, 42.4-gravity, completed 6-7-53, TD 6257.

Kleberg County, Seeligson field. Humble's King Ranch-Seeligson King Ranch C-157, SK&K Survey 177, flowed 127 barrels from Zone 19-C sand, Oligocene 6077-87 feet, ⅛-inch, 41-gravity, completed 6-13-53, TD 7100.

Nueces County, Clara Driscoll, South field. Randerson & Scroggins' Russ & Drainwood 2, George H. Paul Subdivision Driscoll Ranch, Section 109, flowed 4118 barrels from 5046-51 feet, ⅛-inch, 24.8-gravity, completed 5-17-53, TD 6520.

TEXAS DISTRICT 4—NEW DISTILLATE FIELDS

Hidalgo County. Magnolia's Romulo Garza 1, San Salvador Del Tule Grant, flowed 53 barrels distillate and 12.0 million from 8327-33 feet, open, 52.1-gravity, completed 6-10-53, TD 9010.

Jim Wells County, "Hoffines" field. Jake L. Hamon's Gertrude H. Hoffines 1, John Welder Survey, Section 10, flowed 4 barrels distillate and 1.7 million from Frio sand, Oligocene 3372-77 feet, open, 49.6-gravity, completed 6-3-53, TD 5550.

Nueces County, Cayo del Oso field. Southwestern O&R Co.'s State of Texas D-1, Section 32, Flour Bluff & Encinal Farm & Garden Trs., Cayo del Oso Survey, flowed 448 barrels distillate and 32 million from 6663-66 feet, open, 64-gravity, completed 6-16-53, TD 6844.

TEXAS DISTRICT 4—NEW DISTILLATE PAY

Starr County, Sun. North field. Sun Oil Co.'s J. M. de la Garza 7, Santa Teresa Grant, flowed 62 barrels distillate and 12.7 million from 5004-14 feet, open, 64.8-gravity, completed 6-10-53, TD 5795.

TEXAS DISTRICT 4—NEW GAS FIELDS

Duval County, Strake, North field. Panhandle Oil Corp.'s Driscoll Estate B-1, T&NORR Survey 6, flowed 9.7 million from Cole sand, Eocene 2462-72 feet, open, completed 6-7-53, TD 2674.

Hidalgo County. Taylor Oil & Gas Co.'s A. A. McAllen 5, "Santa Anita" Manuel Gomez Grant, ungauged from 11,845-865 feet, completed 5-25-53, TD 12,200.

TEXAS DISTRICT 6—NEW OIL FIELD

Cherokee County. Bobby Manziel's Faye Harris Mason et al 1, J. T. Cook Survey, pumped 46 barrels from Woodbine sand, Upper Cretaceous 5084-90 feet, 34-gravity, completed 6-22-53, TD 5090.

TEXAS DISTRICT 7-C—NEW OIL FIELDS

Concho County. Amerada's J. Ann Waide 1, Fisher & Miller Survey 2771, flowed 76 barrels from Pennsylvanian lime 2214-24 feet, ½-inch, 41-gravity, completed 6-3-53, TD 2862.

Crockett County. Harry J. Russell's Winnie Puckett Martin et al 1, Section 39, Block OP, GC&SF Survey, pumped 8 barrels from Grayburg lime, Permian 1149-61 feet, 2-inch, 31-gravity, completed 6-17-53, TD 1385.

Reagan County. Phillip R. Johnson's O. H.

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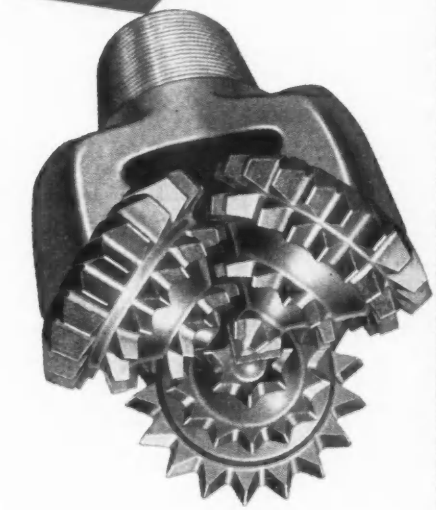
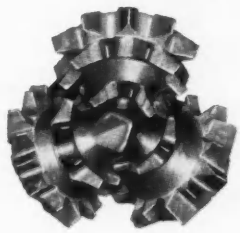
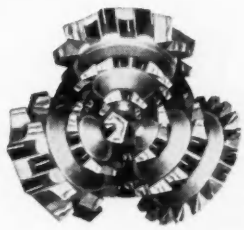


Jet or Standard Circulation

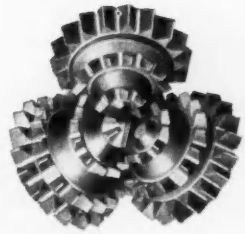
Security 3-Cutter Rock Bits are available with jet as well as standard circulation. The jet bits have a high efficiency due to the exclusive design and location of the jet nozzles.



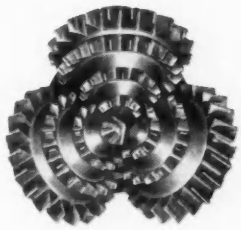
Type **S3** Designed for rapid penetration in soft formations. S3 cutter teeth are exceptionally long and widely-spaced to minimize tooth contact on bottom and facilitate effective cleaning.



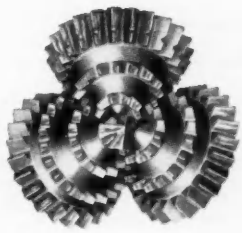
Type **S6** Unsurpassed for fast cutting with light or heavy weights in medium shales, gypsum, salt, chalk, anhydrite, medium lime and unconsolidated formations.



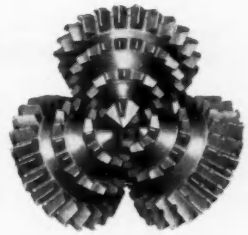
Type **M4** For drilling medium and semi-hard formations such as sand, medium shales, medium hard lime and conglomerates.



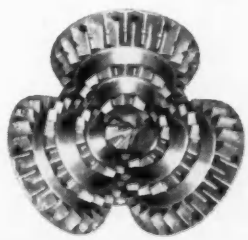
Type **M5** Teeth are closely spaced and sturdy in section. Imparts a chipping and crushing action for effective penetration in formations such as medium hard lime, hard shale and medium hard anhydrite.



Type **H7** For drilling hard formations. Used in hard formations such as lime, shale and anhydrite.



Type **H7L** For drilling hard formations. Used in hard formations such as lime, shale and anhydrite where some extra amount of gage protection is necessary.



Type **H7W** This bit provides fast cutting and long life through extremely hard, abrasive formations. Maximum gage protection is provided by a circumferential web on the gage row of teeth.

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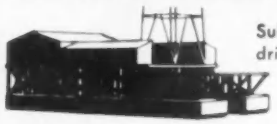
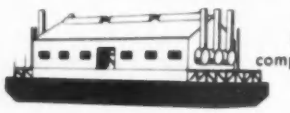


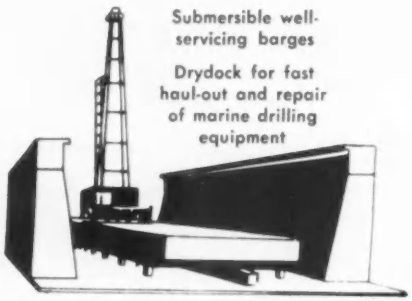
Submersible drilling barges

Tugs



Boiler and compressor barges

Water, oil, and supply barges



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Orange, Texas

DISCOVERIES . . .

Wolters et al 1, GC&SF Survey 1, pumped 18 barrels from Grayburg lime, Permian 2342-2434 feet, 2-inch, 30-gravity, completed 6-4-53, TD 2434.

Unnamed field. Phillips' Kenneth 1-A, Section 16, Block F, C&M Survey, flowed 89 barrels oil and 37 barrels water from Spraberry sand, Permian 6111-26 feet, 17/64-inch, 39.4-gravity, completed 6-19-53, TD 11,043.

Runnels County. E. K. & E. M. Burt et al's C. B. Spill 2, Block 338, J. R. Nunn Survey, flowed 289 barrels from McMillian sand 2637-48 feet, 20/64-inch, 44-gravity, completed 6-10-53, TD 2848.

Schleicher County. C. L. Norsworthy, Jr.'s Virgil J. Powell 1, Section 21, Block A, AB&M Survey, flowed 136 barrels from Canyon sand, Pennsylvanian 3570-3610 feet, 15/64-inch, 36.2-gravity, completed 6-6-53, TD 4800.

Tom Green County. W. C. Kinkel's J. E. Hall 3, Marion Gage Survey 81, pumped 20 barrels oil and 2 barrels water from Feldman sand, 1127-31 feet, 2-inch, 30-gravity, completed 6-19-53, TD 1131.

Upton County. Buffalo Oil Co.'s King Ranch Oil & Lignite Co. 1, Section 24, Block 35, H&TC Survey, flowed 167 barrels from Wichita Albany sand, Pennsylvanian 4783-89 and 4794-4800 feet, 8/64-inch, 35.2-gravity, completed 6-16-53, TD 5532.

TEXAS DISTRICT 7-C—NEW OIL PAY

Runnels County, McMillan field. B. F. Phillips, Jr.'s F. M. Hale 1, Section 32, D. Diaz Survey 532, flowed 84 barrels oil from Morris Sand, Pennsylvanian 3504-10 feet, 12/64-inch, 42-gravity, completed 6-1-53, TD 3905.

TEXAS DISTRICT 7-C—NEW GAS FIELDS

McCulloch County. J. J. Rogers & L. B. Thomas' R. & H. Hoepgle 2, Allison Ogden Survey 14, flowed 0.5 million from 1729-35 feet, open, completed 4-28-53, TD 1735.

Terrell County, Spencer field. Humble's N. D. Blackstone Estate et al 1, Section 58, Block B-2, CCSD&RGNG Survey, flowed 0.3 million from Wichita Albany sand, Pennsylvanian 3405-35 feet, completed 6-11-53, TD 12,303.

TEXAS DISTRICT 8—NEW OIL FIELDS

Andrews County. Anderson-Prichard & J. C. Barnes' University 1-E, Section 7, Block 7, University Lands Survey, Old Well Drilled Deeper, flowed 3353 barrels from Devonian lime, Devonian 12,322-350 and 12,360-382 feet, 1-inch, 44.4-gravity, completed 6-18-53, TD 13,700.

Unnamed field. Herman Brown's Maggie Dora Mann 1, Section 18, Block A-23, PSL Survey, flowed 125 barrels from Clearfork lime, Permian 6377-6517 feet, ½-inch, 34-gravity, completed 5-30-53, TD 6517.

Crane County. Gulf's Gulf-Stanolind-State EH 1, Section 9, Block 30, University Lands Survey, flowed 356 barrels from Ellenburger lime, Ordovician 11,890-935 feet, ½-inch, 48.2-gravity, completed 6-23-53, TD 12,012.

Unnamed field. Gulf's P. J. Lea et al 1, Section 40, Block B-32, PSL Survey, flowed 1254 barrels from Ellenburger lime, Ordovician 8225-70 and 8165-8200 feet, ¼-inch, 41.2-gravity, completed 6-29-53, TD 8448.

Dawson County. McClure, Hopkins & Logan's J. F. Fowler 1, Section 111, Block M, EL&RR Survey, pumped 69 barrels oil and 31 barrels water from San Andres lime, Permian 4940-98 feet, 33-gravity, completed 6-10-53, TD 8575.

Hockley County. Zephyr Drilling Corp. & Sunray et al's C. T. Pace 1, Labor 13, League 33, Baylor County School Land Survey, pumped 93 barrels from Clearfork lime, Permian 6372-6414 feet, 29.4-gravity, completed 6-17-53, TD 7572.

Pecos County. Brown & Thorp Drilling Co. & La Gloria Corp.'s A. A. Sullivan 1-F, Section 98, Block 11, H&GN Survey, pumped 115 barrels oil and 161 barrels water from Ellenburger lime, Ordovician 4018-27 feet, 39.6-gravity, completed 6-19-53, TD 4324.

TEXAS DISTRICT 8—NEW OIL PAYS

Crane County, Jordan field. T. M. Evans' Jordan-Ingram 1, Section 12, Block B-22, PSL Survey, flowed 242 barrels from Pennsylvanian Detrital 7828-50 feet, 10/64-inch, 40.3-gravity, completed 6-21-53, TD 9068.

Ector County, Cowden, South field. Cities Production Corp. & Union Oil Co. Cross 1-C, Section 44, Block 43, T-2-S, T&P Survey, pumped 161 barrels oil and 14 barrels water from Wolfcamp lime, Permian 8230-52 and 8320-40 feet, 2-inch, 33-gravity, completed 6-14-53, TD 12,015.

TEXAS DISTRICT 8—OIL FIELD EXTENSION

Ward County, Scott-Delaware field. Continental's L. M. Watson 2, Section 32, Block 33, H&TC Survey, 1-mile extension, flowed 309 barrels from Delaware sand, Permian 4978-5010, 5130-96 and 5270-5319 feet, 38.3-gravity, completed 6-2-53, TD 5348.

TEXAS DISTRICT 8—NEW DISTILLATE FIELD

Pecos County. H. L. Hunt's Eaton 1, Section 27, Block 3, H&TC Survey, flowed 65 barrels distillate and 3.5 million from Devonian lime, Devonian 5368-5404 feet, 15/64-inch, 61.6-gravity, completed 5-28-53, TD 5710.

UTAH—OIL FIELD EXTENSION

Uintah County, Red Wash field. California Co.'s Red Wash 20, NE NE 29-7s-23e, 1 mile west extension, pumped 15 barrels oil and 40 barrels water from Green River lime, Eocene 5711-16 feet, completed 6-11-53, TD 5919.

WYOMING—NEW OIL FIELDS

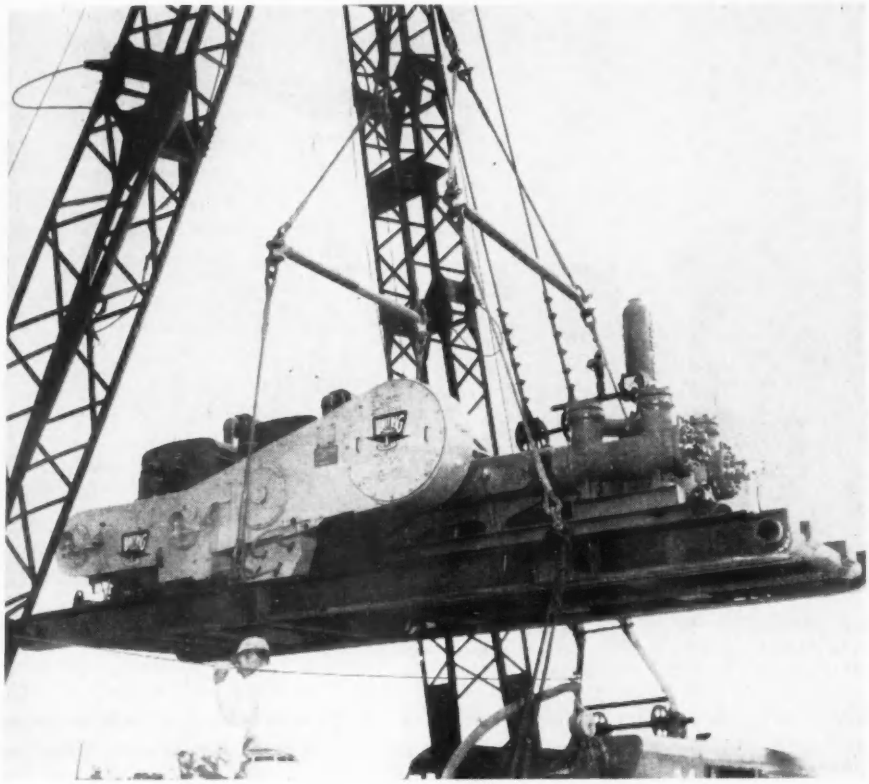
Big Horn County. L. J. Peterson et al's Government 1, C SW NE 2-49n-92w, flowed 960 barrels from Phosphoria dolomite, Permian 5768-5816 feet, ⅜-inch, completed 6-15-53, TD 5856.

Fremont County. Sinclair Oil Co.'s Gov't 1, C SW SE SW 21-33n-95w, flowed 136 barrels from Tensleep sand, Pennsylvanian 10,734-752 feet, 40.4-gravity, completed 6-6-53, TD 11,500.

Weston County. Cheyenne Oil Ventures and Rogers Oil's State 1, SE SW 36-43n-64w, pumped 80 barrels from Newcastle lime, Upper Cretaceous 6736-48 feet, completed 6-20-53, TD 6781.

WYOMING—NEW OIL PAY

Natrona County, West Poison Spider field. Pure Oil Co.'s Unit 3, SW NW SE 10-33n-84w, pumped 16 barrels from Morrison 15,922-16,102 feet, completed 6-10-53, TD 16,602.



MUD PUMP weighing 43,500 pounds is hoisted to a transport bound for South America. Slings shown are widely used on equipment docks.

How to Select Correct Sling for a Job

Here are six factors to be considered before the type, size and length can be specified.

By WALTER C. RICHARDS

Chief Engineer, A. Leschen & Sons Rope Company

HAVE YOU EVER wondered whether the types of slings you have in use are exactly what you should be using? If you have, it is quite understandable. Even a sling user of long experience may become confused occasionally, with the wide selection of slings available by types, constructions, sizes and makes.

This discussion will establish general rules of procedure for the selection and application of wire rope slings—a guide to proper sling selection. The result should mean saving time and eliminating some confusion when slings are specified for a particular job.

A basic question is, of course, should a chain sling or a wire rope sling be used? Both have their merits. Chain slings have "historical" precedence in many applications, but the use of wire rope slings has been steadily increasing within recent years. In general, if the use of one type or the other seems to be based on precedent or habit alone, it is worth checking the application very thoroughly to determine whether that habit should be changed.

Once it has been determined that a wire rope sling will do a better job, there are six factors to consider before the type, size and length of the sling can be specified. These factors are:

1. Object of the load—its size, weight, shape, etc.
2. Working area—for example, amount of headroom.
3. Size and description of crane hook.
4. Angle of inclination—vertical lift, or otherwise.
5. Location and description of lifting lugs, if any.
6. Plane of attachment of fittings.

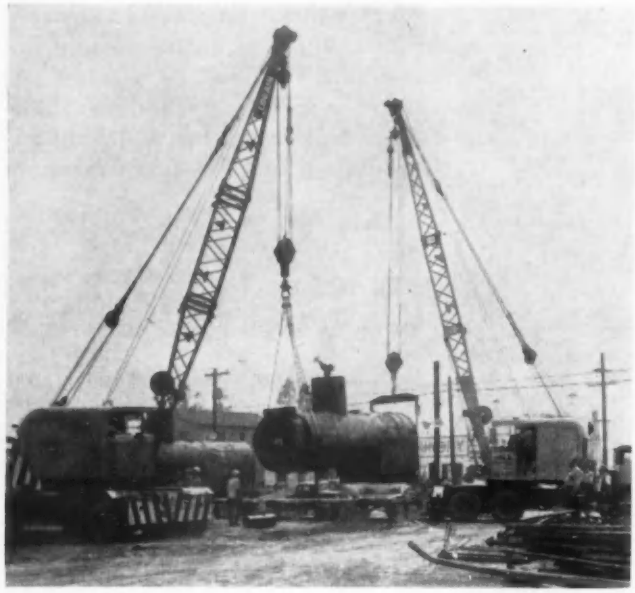
With this information documented, your sling supplier can be of greater help in recommending the sling that will give you the best possible service. First, the best-suited type of sling will be determined.

Slings are classified by three different types:

- Standard single-part wire rope slings.
- Endless slings, which may either be continuous strand (grommet) or spliced endless.
- Multiple part laced or braided slings.

Standard Single-Part Wire Rope Slings. Standard wire rope slings are made up of one or more lengths of standard wire rope. The sling may have a single length of wire rope with necessary end attachments, or be in the form of a bridle, with two, three or four legs. It is well suited for general lifting operations (large or small), where the sling is attached to fixed rings or lugs, and also where sharp bends in the sling are not major considerations. A standard wire rope sling is generally available in sizes from ⅜-inch to 2-inch diameter. Smaller diameters generally are 6x19 construction, and diameters 1¼-inch and over are 6x37 construction.

Single-part slings are available with various combinations of end fittings,



DOUBLE SLING LIFT minimizes possibility of damage to insulation on boiler weighing 8000 pounds.

DRAWWORKS LIFTED by cranes equipped with variety of slings capable of hoisting 60,000-pound unit.

such as thimbles, loops, hooks, open and closed sockets, swaged-sleeve loops, "inlaid" spliced loops and others.

It is usually easy to determine the size of a standard wire rope sling best suited to the application, simply by checking maximum loads to be lifted, and then referring to the rated capacity charts provided by wire rope sling manufacturers. Standard wire rope slings cost less than multiple part slings, but, though you may find you can use this lower-cost standard rope sling, it is a good rule not to let cost misguide you into overlooking more efficient, more economical slings of other types. When standard rope slings are made of flexible, preformed construction, they are easier to handle.

Typical applications include: handling machinery, castings and objects having fixed rings or lugs for attachments.

Continuous Strand or Grommet Slings. A wire rope sling made of a continuous rope strand is called a grommet sling. This single length of strand is laid in place around itself to form a round seven-strand endless sling. It is generally available in sizes from ¼ inch to 2¼ inches in diameter—with strands of 19 wires in sizes up to 1⅛ inches, strands of 37 wires in sizes from 1¼ inches to 2¼ inches.

Grommet slings are generally more efficient than spliced-endless single slings in the short lengths in which these slings are ordinarily used. They are made with only 1 tuck instead of 6 as required in the running splice. Frequently grommet slings can be used without the need of forming loops or attaching fittings. They are ideal for forming sling "hitches" of various types.

Grommet slings may be used for lifting lighter loads, where the sling is not subject to excessive friction and to severe bending, or heavy cylindrical loads. It is economical to have grommet slings available because they are easy to use and easy to handle, and do serve a variety of purposes. Typical uses are setting tanks and raising oil refinery chambers.

Multiple Part Slings. In the construction of multiple part wire rope slings, the principle of lacing or braiding ropes of smaller diameter is followed instead of using a single wire rope as the body of the sling. Two forms of such multiple part slings are called the flat-laced and the braided types.

A flat-laced sling is simply what the name implies—with several parts of wire rope laced together to form a smooth, flat-bodied sling. Actually, the form of the body section is flat rather than round, so that load pressure is distributed over a greater area than with a round-bodied sling. Consequently, it has a strong gripping power on both flat and round surfaces, and there is less wear on the sling, with less marking of highly finished surfaces on the load. Also, there is greater flexibility in the sling—for easy handling.

The loops at the ends of the flat-laced slings are designed to be self-supporting without the use of thimbles or servings, as are usually required in the case of other multiple part slings. Loops are formed by laying in an additional section of wire rope, which forms a round section loop end. No splicing is required in that operation,

About the Author

WALTER C. RICHARDS has been chief engineer of A. Leschen & Sons Rope Company for the last ten years. He is a graduate of the Missouri School of Mines and Metallurgy, obtaining his BS and EM degrees in 1907 and 1911. He followed practical mining a few years before coming with this company in 1918. He is a member of the Wire Rope Technical Board of the Wire Rope Manufacturers, and the API.

and flexibility is maintained in the sling—both in body and the loops.

Braided Slings. Braided slings consist of several parts of wire rope assembled into a round-bodied braid. The most commonly used types are 6-part or 8-part braided slings.

The braiding process provides a highly efficient combination of all-around flexibility with utmost strength. Because of the braiding, internal tension in the sling is at a minimum, so that there is far less tendency for it to kink or loop. It wraps around a load easily and securely, without becoming "set" or deformed in any way.

This makes the sling exceptionally easy to handle, easy to apply to both the load and the crane hoop, and also easy to carry odd-shaped loads, as well as to carry more slippery objects. Highly finished loads are held smugly and surely with braided slings, without marring or scuffing the finished surfaces.

Because of the combination of wire rope parts formed into a braid, considerable strength is built up into this type of sling as compared with single-part slings, of equal flexibility. Consequently, this type of sling, as well as the flat-laced type, are most suitable for heavy duty work. Both types are available with wire rope parts in sizes from ⅛-inch diameter up to 1-inch or 1⅛ inches. It is easy to understand, then, that if you use an 8-part sling, with each part consisting of a complete wire rope, you are able to carry loads of tremendous weight, yet maintaining sufficient flexibility in the sling for easy handling.

Flat-laced and braided slings may be used in single part or in the form of two, three or four-leg bridles. They may be used in place of single slings and in addition may be specified for the most difficult applications.

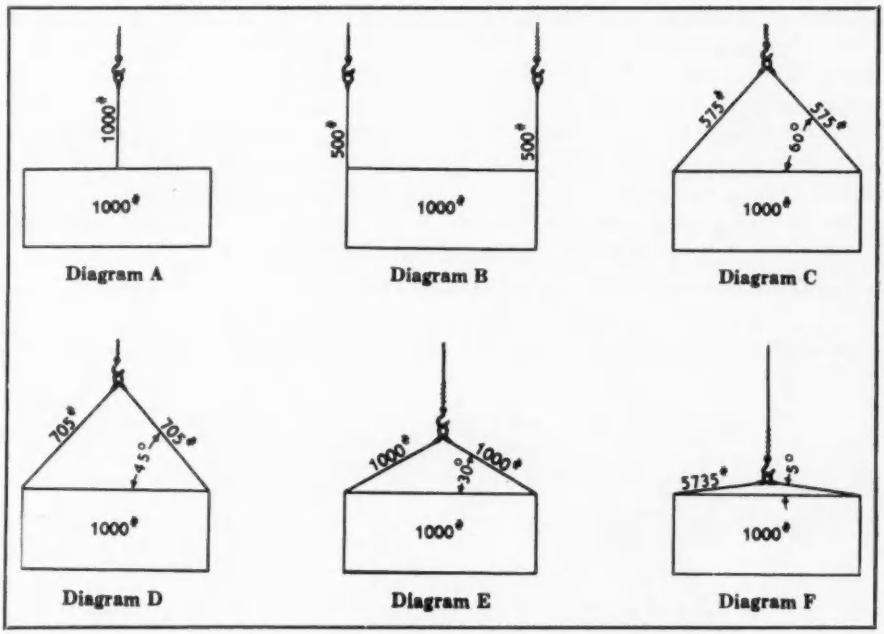
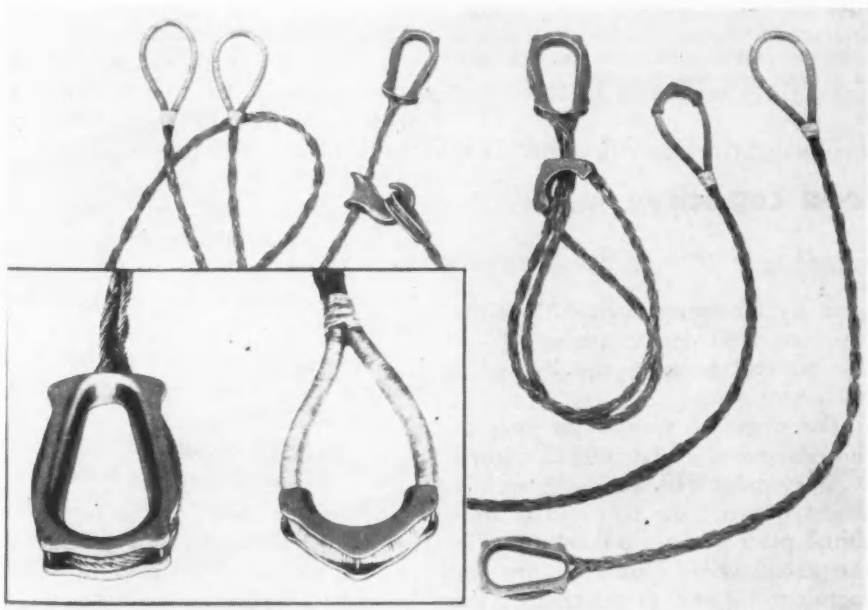


Fig. 1—These diagrams show how tension in sling increases as the angle with horizontal plane increases. For example, in Diagram A, a 1000-pound load creates 1000 pounds of tension on vertical center lift. Diagram F demonstrates high tension produced when a sling is used at a very flat angle.



EIGHT-PART BRAIDED SLING with new type re-useable thimble fitting attached by pins instead of conventional hammered-down clamps and readily removable for re-use. Since sling fittings generally outlast sling itself, substantial savings are made by re-use.

Proper Diameters and Lengths to Order. Regardless of the type of sling used, you must determine the most suitable and most efficient sling length and diameter for the given application. These can only be calculated from the weight and shape of the load to be lifted. Also, it is necessary to know whether the legs of the sling will lift vertically, or at an angle. The nearer vertical the legs, the less the tension in the sling.

This is illustrated in Figure 1. It shows, for example, that a rope lifting a 1000-pound load with legs vertical, requires a 1000-pound capacity sling. As the verticle angle increases, the sling must be of continuously greater capacity—up to about six times the weight of the load at 170 degrees.

If you have any question regarding the lengths or diameters of slings you should use, be sure to tell your supplier all the details of your requirements. This procedure is the only sure way of getting exactly what you need.

When ordering, the length is customarily shown from bearing to bearing of loop, thimble, hook or socket for standard, flat-laced and braided slings. For grommets the circumference should be given or the length when doubled.

With an understanding of the details of design and application, one should also give consideration to the

quality of material, engineering skill and workmanship that go into the production of slings. Where workers' safety, as well as efficiency and economy of operation are involved, it is extremely important to obtain the best quality product available.

Sling testing by users is a good idea wherever and whenever facilities are available for that purpose. Work tests are also advisable to determine exactly how a particular make, type or size sling performs best on the job.

A good understanding of the types of slings available is, of course, most desirable in wire rope sling selection. The additional services and attention given by your sling suppliers in helping you select the correct sling is also important. Equally important is the extra care and attention that is given slings in their manufacture. The net result is long sling service, greater safety and reduced sling costs.

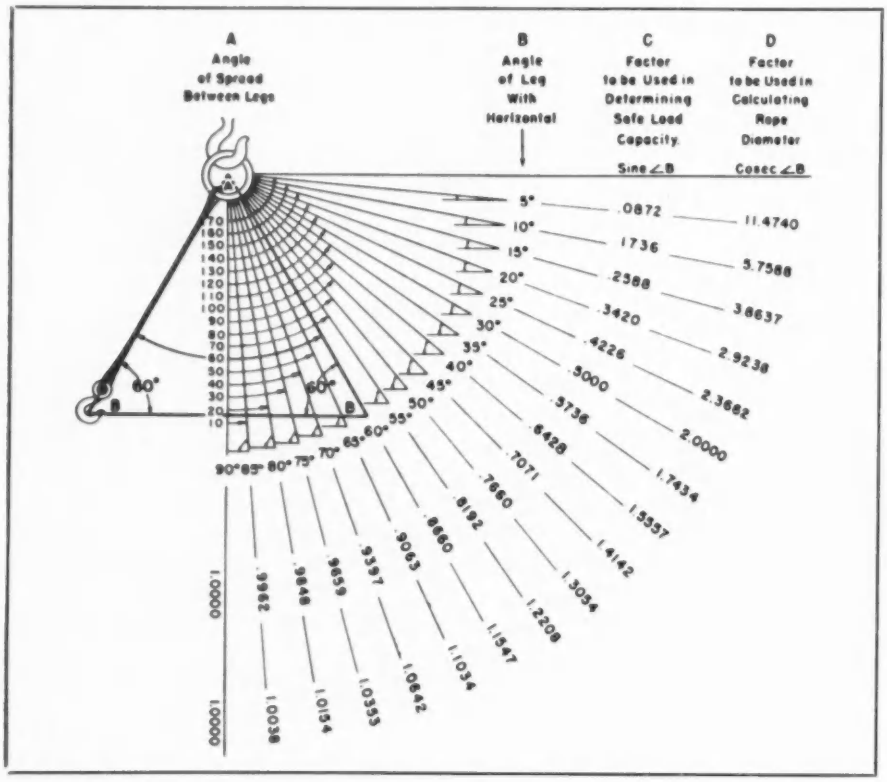


Fig. 2—To calculate tension developed in each leg by this vertical load of 5000 pounds multiply load by factor in column D opposite angle of 50 degrees. Tension T in one inclined leg equals ½ total vertical load x factor in Column D. 5000 pounds x 1.3054 = 6527 pounds. Applying a factor of 7, a rope with breaking strength of 45,689 pounds or 22.8 tons is required. This would indicate a ¾-inch 6 x 19 wire rope. Or it will be seen that to handle 6527 pounds safely on a single leg, a ¾-inch wire rope is needed.

How to determine a safe load capacity of a given sling . . .

FIGURE 2 may be used in determining the safe load capacity of a given sling or in calculating the proper rope to use for a given load.

The sloping lines correspond to the legs of the sling taken at intervals of 5 degrees. They may be used as shown by the diagram in the upper left hand corner to determine the angles formed by the legs at the ring or link, and with a horizontal plane.

To illustrate this, a triangle is shown in heavy lines, one side of which is detailed as the leg of a sling. The legs form the 60 degree angle "A" at the top, and 2-60 degree angles "B" at the bottom, between the legs of a horizontal plane.

The angle of spread (at ring or link) is shown in the vertical column A. The figures shown under B are the angles between the legs and a horizontal plane and are the ones used in the calculations. Under C are the factors to be used in determining the safe load capacities and under D the factors used when calculating the diameters of the rope required.

Examples

(1) *What is the safe load that may be handled with a 2-leg bridle sling made of ⅝-inch diameter wire rope, where the conditions require that the legs be spread at an angle of 70°?*

From Figure 2 it will be seen that if the angle of spread between legs is 70°, the angle (B) that each leg makes with the horizontal (when in balance) is 55°. A stress of 2.3 tons (see first column of loads on page 7) could be applied to each leg, and 4.6 tons or 9200 pounds total for the sling. To determine the safe load at the required angle the figure 9200 is multiplied by the factor .8192 shown in column C opposite the 55° horizontal angle.

Required safe load W, at given angle of spread = safe load for two vertical ropes × factor in in Column C = 9200 × .8192
7536 pounds.

(2) *What diameter rope must be used in a two-leg bridle sling to handle 10,000 pounds when legs are spread at an angle of 80°?*

As in the first example the chart will show that with the legs spread at an angle of 80° the horizontal angles would be 50° each. One half the load or 5000 pounds must be carried by each leg.

To calculate the tension developed in each leg by this vertical load of 5000 pounds multiply the load by the factor in column D opposite the angle of 50°.

Tension T in one inclined leg = ½ total vertical load × factor in Column D.
= 5000 pounds × 1.3054
6527 pounds.

Applying a factor of 7, a rope with a breaking strength of 45,689 pounds or 22.8 tons is required. This would indicate a ¾-inch wire rope. Or it will be seen that to handle 6527 pounds safely on a single leg, a ¾-inch wire rope is needed.—**The End.**

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the only all friction clutch drive compound rigs at the international oil exposition . . .

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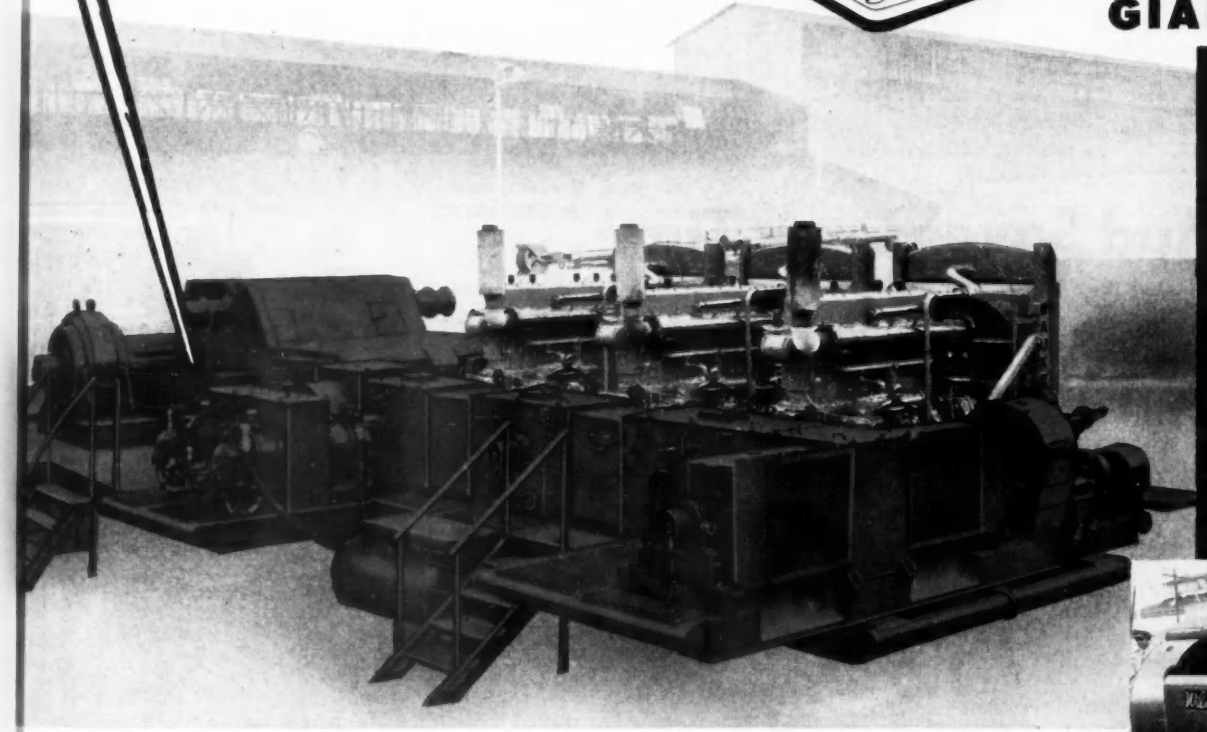

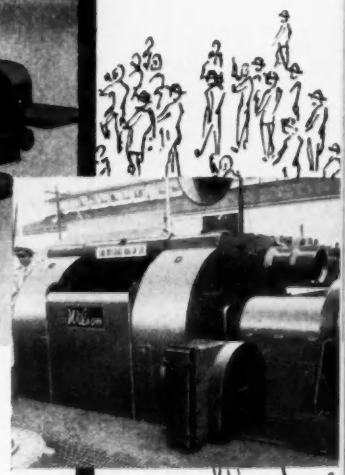

Our customers tell us the jaw clutch is obsolete — But WILSON is the *only* manufacturer now building all friction clutch compound rigs — And these rigs use only one kind of clutch, the famous Air-Tube Disc Clutch — Some of the rigs at Tulsa used *four* kinds of clutches — Be modern — Use WILSON

THE FIRST NAME IN DRILLING RIGS

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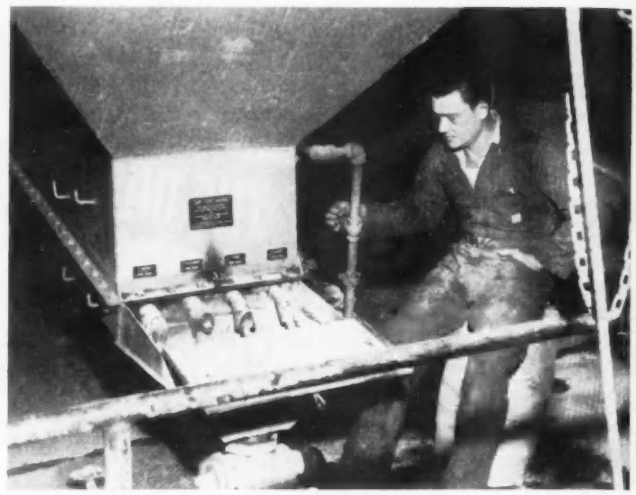
MANUFACTURING CO., Inc.

WICHITA FALLS, TEXAS

1 SACKS ARE A PROBLEM. Cutting and mixing mud takes a big part of drilling crew's time. Often the task comes at a time when the crew members could be used elsewhere.



2 WITH THE NEW METHOD, one man can handle the work that otherwise would take four or five. The use of bulk mud has resulted in a big saving in manpower.

Bulk Mud Saves Crew Time . . .
. . . Holds Waste to a Minimum

By PHILIP L. McLAUGHLIN, WORLD OIL Staff

BULK MUD saves valuable crew time and reduces mud wastage to a minimum.

The advantages of bulk mud are many. Some of them are:

- Automatic feeding requires only the occasional attention of one man.
- Bulk rig equipment allows feeding at a predetermined, uniform rate and results in a uniform mud weight throughout the system.
- Does away with wastage resulting from broken bags and the material normally left in the cut bags.
- The mud is stored in steel bins at the rig protected from the weather.
- Large volumes of mud are available for emergencies and extra crew members are not required.

All of this had been made feasible by the development of the air-activated gravity flow system.

Air gravity rig tanks are designed for easy portability and use at well sites. They stand about 12 feet high with an entraining hopper at ground level and are equipped with proportioning discharge valves. The material discharges into a conventional cone and jet mixer where it is mixed with the mud. The ground barite is fluidized in the bottom of the rig tank with compressed air fed through porous blocks in the bottom of the tank.

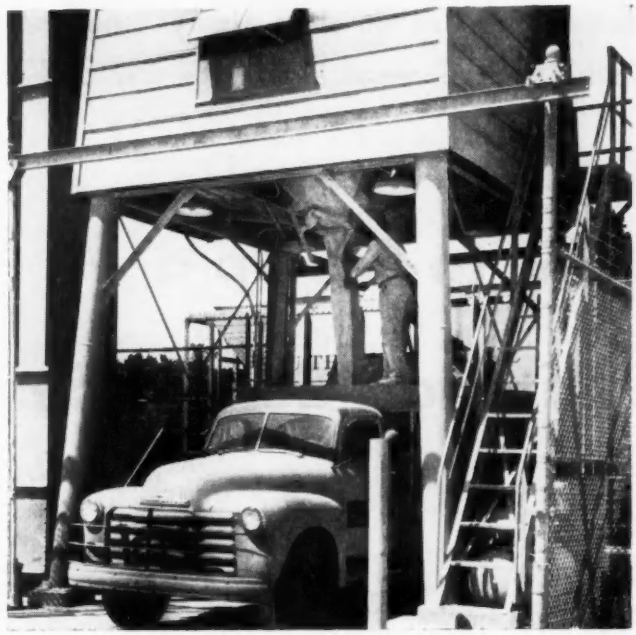
The fluidized material then has flow chacteristics approaching those of water and is proportioned through various size valves from the rig tank to the mixing hopper. The valves are calibrated and known constant amounts are discharged at various air pressures. Small blowers furnish the compressed air at an operating pressure of 9 to 16 ounces. These tanks are furnished to the operators by the distributor who sells the bulk mud.

The normal movement of bulk barite from manufacturing plant to the well is by bulk covered hopper cars from the manufacturing point to distributors station and from there to the rig is by specially designed transport tanks mounted on trucks or barges. The service is available on land and on water.

More than 80 percent of the barite manufactured for oil well use in the U. S. is consumed by wells drilled in a strip extending from a distance of 50 to 75 miles inland along the Gulf Coast of Texas and Louisiana. This is the area of deep, high-pressure, high-temperature drilling, and the area where heavy muds are frequently lost to the formation.

The facilities required for the storage and distribution of bulk barite are expensive. Although there are comparatively few bulk barite stations and distributors along the Gulf Coast of Texas, the investment necessary to distribute bulk is approaching $1 million. The concentrated use of weighting material is therefore necessary for satisfactory distribution, and the specialized distribution equipment makes the product a premium performer and requires a premium price.

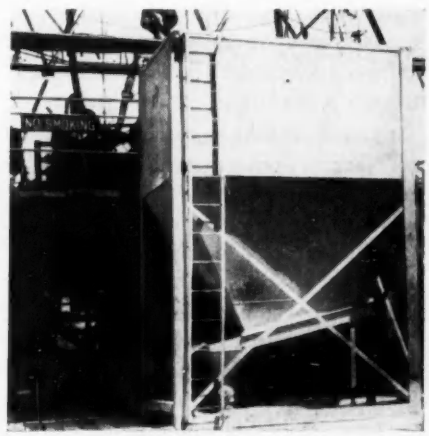
3 **MODERN BULK MUD PLANT** of 20,000-sack capacity, with storage elevator, overhead bin and scale house. Plant is located where concentration of rigs require relatively large amount of mud material.



4 **LOADING TRUCK** at plant. Material flows by gravity from an overhead bin to hopper scale where mud is weighed. Mud is discharged through canvas sock to truck. Printed weight ticket furnished with each load.

Photo Courtesy Baroid

5 **TRUCK UNLOADS INTO RIG STORAGE TANK.** Material is transferred by a hydraulically-raised jointed screw-type conveyor driven by power takeoff. Trucks normally carry 255 sacks of material. Unloading time—8 to 10 minutes by one man.



6 **RIG STORAGE TANK** with air gravity feeding has 700-sack capacity. Often as many as four or more tanks are on a single location.

7 **ON LOCATION,** a bulk mud truck and storage tank.

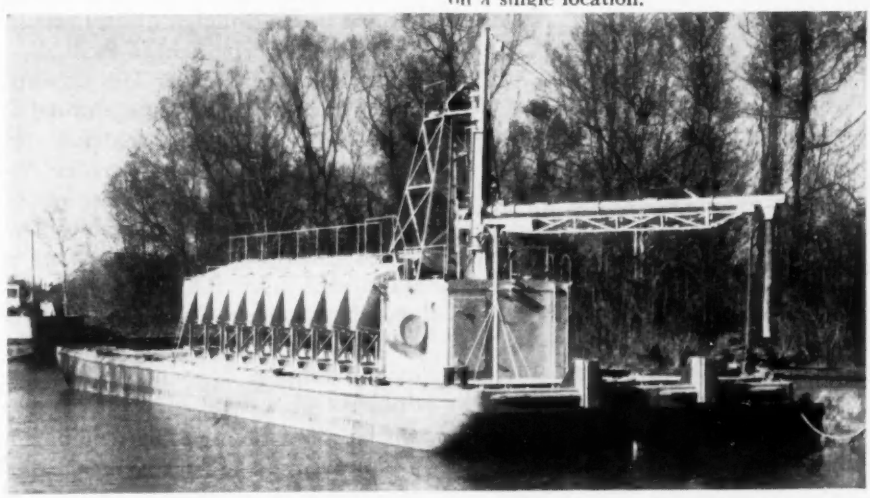


Photo Courtesy Magnet Cove Barium Corp.

8 **BULK MUD BARGES** are coming into use in coastal waters, delivering mud to marine operations.

—**THE END**

Equipment is a big investment. Drilling contractors know this. But do they always know where this equipment is, and what shape it's in? An expert tells . . .

How to Set Up a Materials Control System

By J. T. USSERY, President,
Oil Country Inventory Service, Tulsa

DRILLING EQUIPMENT represents an impressive investment, and if the drilling contractor is to protect that investment it is necessary for him at all times to have complete control over its use and movement. This is achieved through a materials control system.

When a drilling company is organized, large capital outlays are usually necessary and in many cases substantial loans must be negotiated in order that the required equipment be purchased. The first, almost automatic, reaction of a businessman after such a purchase has been effected, is to insure that complete records be kept of this equipment from the day of purchase until the day it is junked or sold. Such records will reflect at any time the following information concerning that group of equipment which has been assembled as a complete drilling unit and has been assigned a rig number.

- Date of acquisition, purchase price and vendor.
- A voucher reference to the exact invoice containing the above information.
- The company registered equipment number which has been assigned to the piece of equipment and has been painted or stenciled on a visible surface on the body of the equipment.
- All of the physical characteristics of the equipment which should include dimensions, type, model, rating, serial number, capacity, series and weight.
- A record of all major repairs or additions to the equipment.
- A record of movement of equipment from rig to rig and from rig to shop or yards.
- A history of total footage drilled by each rig.

A consistent and diligent pursuit of the information enumerated above is the basic requirement for a sound materials control system. A company that has kept a running record of its equipment will be rewarded by confidence in reporting to management or any federal or state tax agency.

A list of the instances where the results of materials control is or should be used in the drilling industry, would find one fact is common to them all—money can be saved or lost depending on the amount of time and detail spent on the control of material. Ad valorem tax reports may often be distorted as a result of improper or insufficient control. If material control is not practiced when equipment is transferred from rig to rig or is replaced, junked or sold, the obvious result is again distortion in the drilling tool investment account. While the drilling tool account as a whole might not be affected unless the equipment is destroyed, junked or sold, the equipment which has been charged to a particular rig will not reconcile with a physical inventory of that rig. When considering the sale of one or more rigs, or yards, or contemplating the splitting of ownership by taking in additional partners, it is obvious that controversy could arise in trying to arrive at an equitable selling price by using the information taken from the drilling tool ledger lacking good materials control. A purchase of this nature calls for an inventory taken by a competent person qualified to give a detailed and unbiased report on the equipment in question.

One of the first places where materials control should be started is with the control of the use and movement of drilling bits. If an effective means of well cost analysis is to be achieved, it is necessary to record the following materials control information.

1. Cost of bits delivered to well.
2. Size and make.
3. Type; fishtail, drag, pilot, roller, etc.
4. Condition; new, rerun, retip.
5. Run or trip number.
6. Actual footage cut by bit; depth from to depth pulled; type of hole cut, new cut, reamed or fishing.
7. Type of bit (for hard or soft formations); serial number.

A bit record listing all information in items 2 through 7 should be kept with painstaking care on each rig for each well drilled. This record should be sent to the office at the close of each month. This applies when the rig is on location, or when the well is finished. Of course it is useless to hope for a peak of effectiveness in cost analysis and correct information for accurate billing of bits if there is not a firm understanding with each toolpusher or district office to the effect that there must be a material transfer made out for each bit which is transferred to the next well, returned to the yard or to the supply house for credit. It is most important that a firm understanding be reached with the field concerning the importance of reporting the use and movement of these bits.

When this information is posted in a bit control ledger it is at once evi-

dent that an accurate and detained accounting can be made of each bit purchased. The ledger should also reflect the purchase price, the well to which bits were charged, invoice number, etc. and all the information also as reported on the drilling bit record. With this information at hand it is relatively easy to determine the exact cost of bits for the account of the contractor and the cost of those bits which are to be billed to the operator.

• When should materials control be started and why?

Equipment represents a direct outlay of very large sums of capital for tangible assets. In times of normal supply and demand it decreases in book value with normal usage, and intrinsic value with the improvement of engineering design, and finally into obsolescence or is eventually discarded in favor of newer equipment. However, before this time is reached substantial repairs, additions, deletion, change in design, etc. will have been made to the equipment—all of which should be recorded on the equipment specification card if the changes are of major proportions. Now, if this information within the control system is to serve the safety engineer, equipment man, accountant and purchasing agent to the best advantage, it must be complete. The most logical way in which this can be accomplished is by starting control when the equipment is purchased.

• What department should originate and coordinate the control?

The very word "control" denotes almost meticulous detail in recording as well as persistent follow-up with the field. Therefore we should turn to the department which has been trained in the handling of detail—the accounting department. Of course it is realized, that no one department can handle the entire job without the conscientious cooperation of the other departments involved. However, once the necessity of material control is evident, then the accounting department should be given the necessary authority to bring the project to a successful operating level. This will mean that the controller or chief accountant should have the authority to employ as many experienced men as necessary, and of such calibre that the job will be done in a proficient manner. At this point it would be well to consider the qualifications of the person selected or to be selected to supervise the section or subsection assigned the responsibility of materials control.

One of the prime qualifications is that this man should be familiar with

COMPANY NAME

TRANSFER OF MATERIALS REPORT NO. 00000000

For Movements of Materials To or From Rigs, Warehouses, or Plants From One District to Another District.

Order No. | By | Date

Shipped From:

Shipped To:

Shipped via:

Was Used for:

To be Used for:

MATERIAL (Include Serial No., Model, Type, Size, Series, Make.)	Equip. No.	Condition	Quantity	
				This space to be used for pricing set up according to individual requirements.

ADD: Warehouse Handling Charge

TOTAL

APPROVED: Warehouseman:

APPROVED: Drilling Supt. or Toolpusher:

RECEIVED By: DATE

NOTE: If you are not an employee of the company whose name appears at top of this transfer sign for material received on line below.

This space for office use.
Account Classification.

NAME DATE

COMPANY

Priced by Distribution Posted by

THESE FORMS can be used in materials control program. Top form for transfer of material report. Transfers should be pre-numbered and controlled by accounting department with same care as given checks. Below is registered equipment record form, front and back view.

Registered Equipment Record

ITEM (Noun Name First) MAKE MODEL TYPE SIZE

HP. RATING SERIES RPM VOLTAGE AMPS. WATTS PHASE

GRADE O.D. I.D. WALL THICKNESS THREAD MATERIAL TYPE CONSTR.

STAGE GAUGE TEST WP. API. No. SAE. No. CAPACITY

PITCH PITCT DIA. SECTION GEAR TYPE GEAR RATIO No. TEETH

LENGTH WIDTH HEIGHT WEIGHT

Registered Equipment Record (Reverse Side)
(History)

Voucher Reference	Transfer Number	Registered Equip. No.	Serial No.	Quan.	Price	Cond.	From	To	Date	Remarks

This type of card will adequately describe any piece of equipment. It can readily be seen that all specifications will not apply to each piece of equipment. Only about one fourth of the total specifications are required for any one type.

all phases of the operations and preferably to have had actual experience in the field. He should be familiar with and understand the functions of the equipment used in drilling a well; be conversant on the function in particular of the major equipment such as compounds, torque converters, gas, gasoline and diesel engines, derricks, blow out preventers, swivels, kellys, duplex and triplex pumps, crown blocks, drill collars, rotary tables, etc. He should have experience in the accounting phase of materials control. He should be thoroughly instructed as to the ultimate result the company is striving for and have well established within his own mind the way in which it can be achieved. Once there is complete agreement on the end result as well as procedure and limit of authority, the materials man should be given sufficient freedom of movement to allow him to travel to the field at his own discretion to check his office records by physical inventory.

• The reason for failure in materials control and its remedy.

As a rule the first danger signal to appear indicating that materials control has failed is when a physical inventory of all equipment will not agree with the books. It is at this time that the company will realize that the degree of success which can be expected from materials control is commensurate only to the amount of time and effort expended.

Other danger signals which become apparent when control starts to lag will manifest themselves in the following way: The drilling bit ledger control will not check out with the record of bits used on a well. Serial numbers, size, type and other specifications of equipment transferred from rig to rig, rig to yard, and yard to yard cannot be identified as being the equipment listed in the registered equipment ledger in the office. Registered equipment which is not assigned to any specific rig such as "migratory equipment" used from rig to rig seems to disappear. At a later date this equipment may reappear in another district and occasionally is never located again. Items such as blowout preventers, drilling gates, portable mud pits, steamers, and auxillary slush pump units are often found in this category.

About the Author

J. T. USSERY became conscious of the importance of good materials control while chasing equipment through the jungles of Venezuela. His interest in this work originated while he was employed with Creole Petroleum Corporation in South America and he became an expert in this field. Ussery attended Tulsa University where he studied petroleum engineering and in 1937 joined Shell Oil Company. He was with Creole in Venezuela for about ten years and in 1950 joined Loffland Brothers Company, Tulsa, in the cost analysis section. He organized Oil Country Inventory Service in January, 1953, which specializes in materials control work and physical inventory of field equipment for the drilling and production branches of the oil industry.

It is not difficult to control materials and equipment if industry recognizes several factors. The key controlling factor is the man who is actually in charge of moving the equipment or material. He may be and usually is the toolpusher, head driller or warehouseman, if a warehouse or yard is operated. The whole system is based on the realization that when equipment is moved or transferred it must be reported to the department responsible for the control. Therefore, more time should be spent in explaining and showing this man the basic facts and elements of materials control, why complete descriptions are necessary, why promptness in advising the office of any movement of equipment is important.

It is common knowledge throughout the oil industry that field men hold their paper work to an absolute minimum. This can be understood when it is realized that field men are generally employed for a type of work which does not require paper work as a qualification for the job. However when it comes to the point where operating expense is being held at a minimum and the responsibility of reports, transfers, purchase orders, etc. rest on the shoulders of the toolpusher, then it should be part of the standard operating policy that this man be given sufficient instruction to allow him to discharge his responsibilities at the level necessary to satisfy the requests being made of him. The above is one of the reasons that a materials man cannot be held down to a desk, he must have enough freedom of movement to enable him to keep his finger on the pulse of the job.

• Physical inventories—the foundation of materials control.

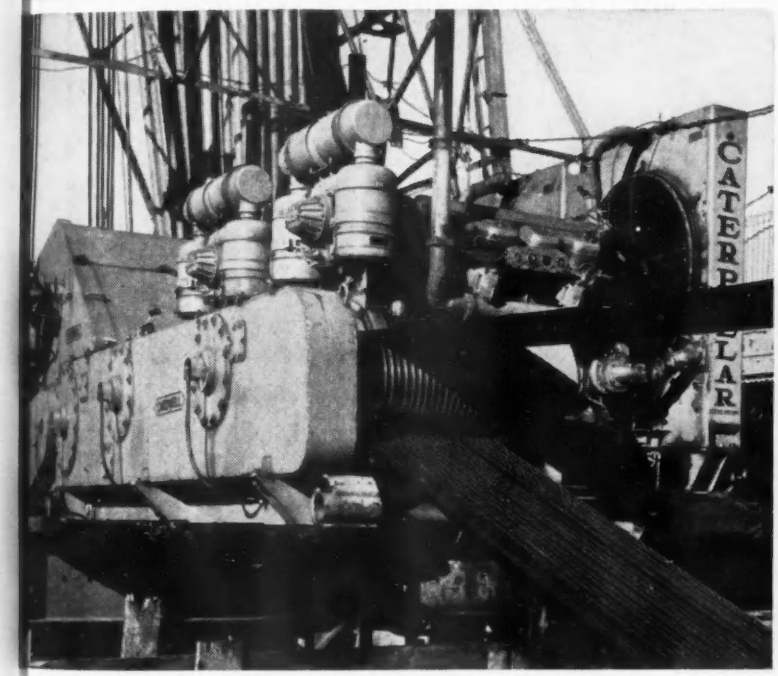
Any materials control system regardless of the time and effort spent on it is only as good as the physical inventory taken to confirm it. Drilling tool ledgers, registered equipment records and any other means of keeping records of equipment on paper lose much of their value unless regular complete inventories are taken to confirm the accuracy of the paper work done. In any profession, whether it be accounting, legal, engineering, etc. it is learned early in practice the value of checking any report, analysis or set of plans before submitting to management. Materials control is no exception. In fact with the great strides which have been taken in the field of engineering design, inventories are no longer just a list of pig iron. A detailed inventory of a modern day rotary drilling rig with all of its associated equipment is no less than a technical report of the quantity, condition, location and value of the equipment owned by a company or individual.

Due to the necessity of congruity between inventory descriptions and office postings from invoices, the man who takes an inventory must have a good knowledge of three things: First, the detailed information required by the accounting department; second, a knowledge of material such that he can recognize the equipment and knows well the function of it; third, a talent for organization of data and the ability to make a reconciliation of the inventory. Perhaps the person best qualified to conduct an inventory is the hybrid of the oil industry—a good materials man. He can also make possible harmonious liaison between the accounting department and the field, a condition always desired but seldom realized.

A statement of proven fact is that materials control does not cost—it pays.—**The End.**

BOTTOMED AT 10,805 FEET...

READY FOR AN EASY MOVE



In Williston Basin, this hole was bottomed at 10,805 feet by Taylor Drilling Company, Lewiston, Mont. The next move is easy because the operation is entirely powered by Caterpillar Oilfield Engines and an Electric Set.

This drilling contractor compounded his two D375 Diesels to a Cardwell Model "O" Rig and a Gardner-Denver 7¾" x 16" mud pump. The Cat* D3400 Electric Set provided power for auxiliary motors and lights.

By standardizing, the company saved money and assured itself of dependable drilling power, good service and quick moving time.

The two D375 Diesels provide an honest intermittent rating of 670 HP for hoisting under maximum conditions. In addition, they are easy to move.

The D3400 Caterpillar Electric Set is the self-regulated type. It needs no complicated switchgear, and starts larger motors than conventional generators of equal size. Like the oilfield engines, it is easy to transport.

Standardize and save money. Operators and mechanics become familiar with one make of engine. Parts inventory can be eliminated. And you get quick, reliable one-stop service from *one* dealer—day or night.

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CATERPILLAR, Peoria, Illinois.

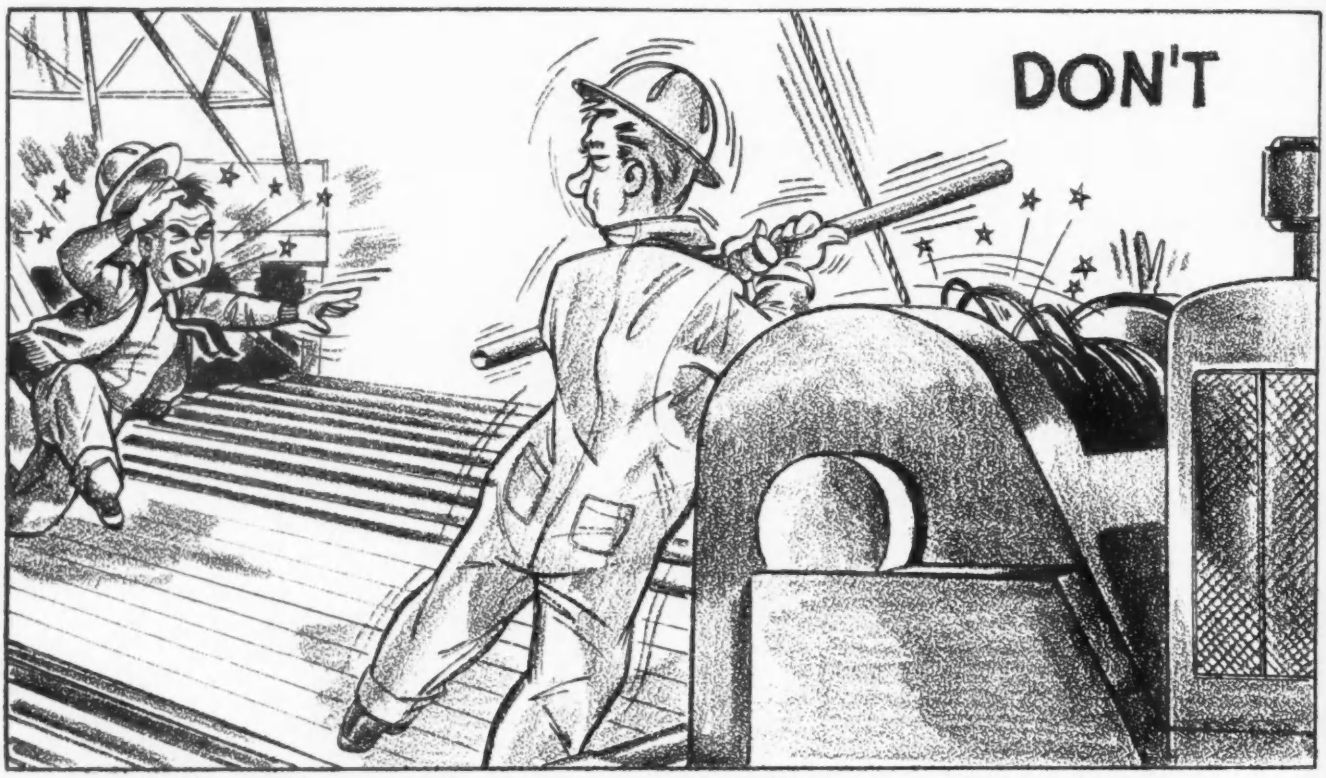
CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

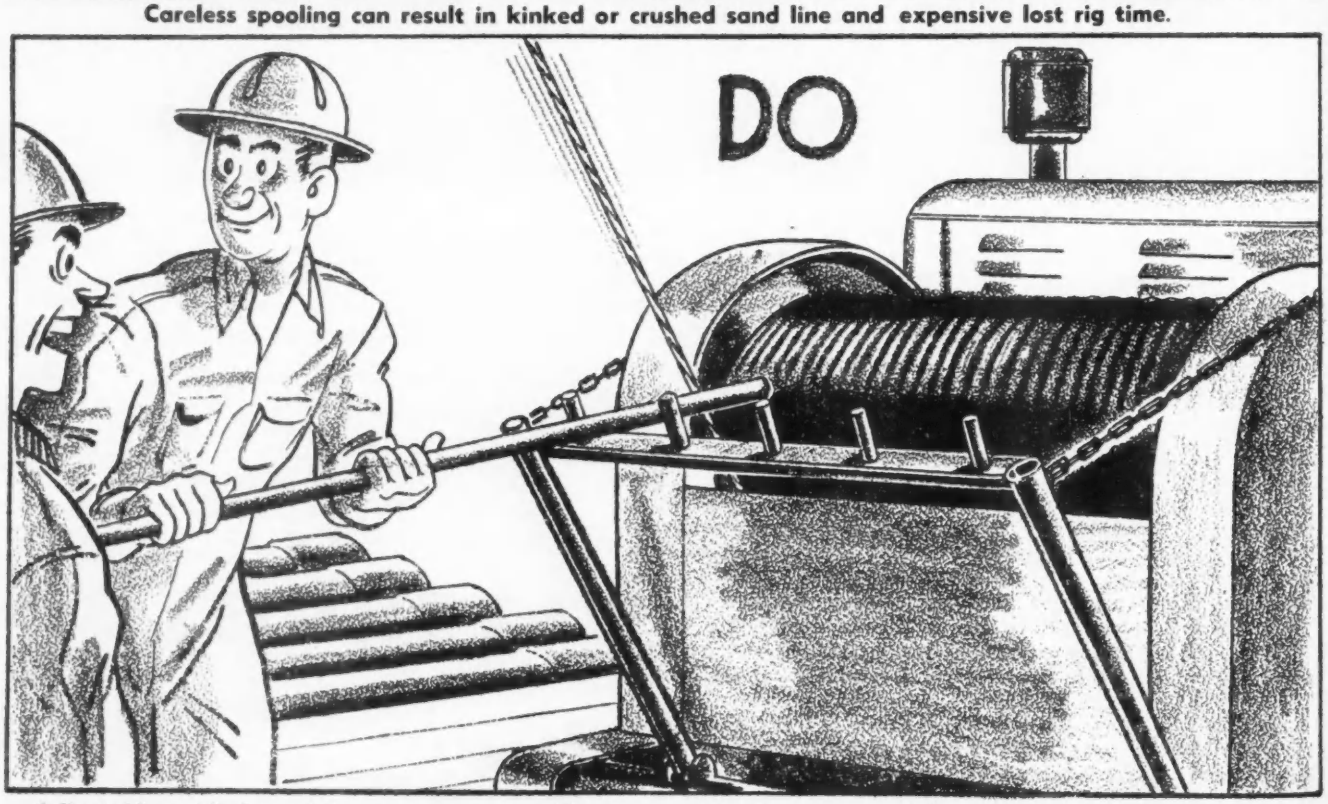
**WE'VE MADE CLAIMS...
NOW MAKE US
PROVE THEM**

World Oil Graphics

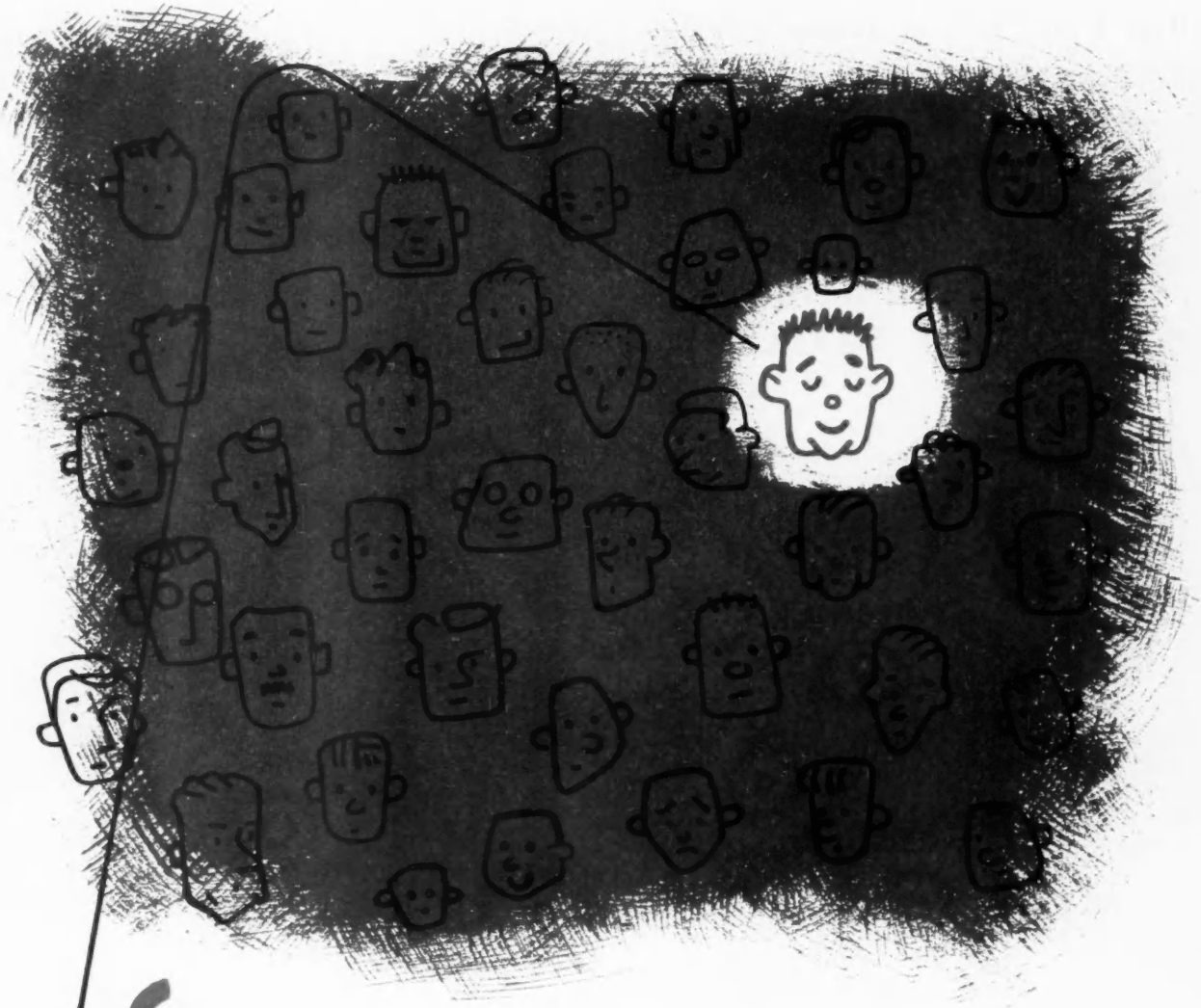
Sand Line Spooling Care



Careless spooling can result in kinked or crushed sand line and expensive lost rig time.



Adjustable guide bar with evenly spaced guide pins provides leverage enabling man to guide line on evenly



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it's Drilling and Service.

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TRUCO DIAMOND BITS
AND D & S CORE BARRELS

In Part 1 the authors discussed methods of appraising straight by inclined holes in homogeneous and stratified formations—either horizontal or inclined. Now it is shown how the problems of slanting formations can be overcome by applying this study to field problems . . . and . . .

How to Cut Costs in Crooked Hole Areas

By ARTHUR LUBINSKI, Stanolind Oil and Gas Company, Tulsa,
and **H. B. WOODS,** Hughes Tool Company, Houston

Hole Inclination in Anisotropic Slanting Formations. The determination of the angle toward which the hole tends, i.e., the equilibrium angle for horizontal formations was relatively easy by use of Figure 2. (See Part 1) This problem is more complicated in the case of inclined formations. The results are plotted in Figures 9, 10 and 11 for anisotropy indicates h equal to 0.025, 0.050, and 0.075 respectively. The various drawings of each of these figures are for various formation dips, the dip of the formation being the angle γ of bedding plane with respect to the horizontal as shown in Figure 8 (see Part 1).

In all of these figures, the equilibrium angle in degrees is plotted vs. the diametral clearance in inches between the collars and the hole. Curves are given for various values of the weight on the bit in dimensionless units. A convenient conversion table of dimensionless units into pounds is given in Figure 11.

The way of using Figures 9 to 11 will be explained with a few examples.

Example 1. Consider, for instance, formations slanting 30 degrees in which field practice indicates an angle of about 2½ degrees will be maintained when drilling 9-inch hole with 6¼-inch drill collars and 4500-pound weight. Hole clearance is then 2.75 inches and weight is one dimensionless unit as indicated in the table of Figure 11. Both charts 9d and 10d are for $\gamma = 30$ degrees. Point A on chart 10d indicates an inclination of 2¾ degrees which is close to the actual field value; and consequently, the anisotropy index h is equal to about 0.050.

Now study the effect in this particular field of changes of weight, size of drill collars, and clearance.

If the weight is doubled to two dimensionless units of 9000 pounds, the hole inclination will increase to 6¼ degrees as indicated by point B. If the weight is increased to 18,000 pounds and 36,000 pounds, the hole inclination will increase to 13¼ degrees and 21½ degrees respectively, as indicated by points C and D.

Consider now that the 6¼-inch drill collars are replaced by 8⅛-inch drill collars. Point E (clearance = ⅞ inch) indicates that for one dimensionless unit of weight, which now means 9000 pounds, the inclination is 3½ degrees. In other words, the use of larger drill collars and twice the weight resulted in only a small increase in inclination.

Consider now still larger drill collars, such as 10½-inch in 12¼-inch hole. Point F (clearance = 1¾ inch) indicates that 18,000-pound weight results in an inclination of 3 degrees. In this case, however, the hole size was increased as well as the collar size, and the additional 9000 pounds are only partially used to drill faster and partially to drill a larger hole. A rough way of calculating the increase in drilling rate is to take the drilling rate as directly proportional to the weight per inch diameter of hole.

Experiments show that the following relationship is quite accurate:

$$R = k \frac{W_n}{D}$$

Part 2

Wherein

R is drilling rate
W is weight on bit
D is hole diameter
k is a proportionality factor
n is an exponent depending on the formation, which was taken equal to unity in the above approximation.

There is no experimental justification for the often used relationship:

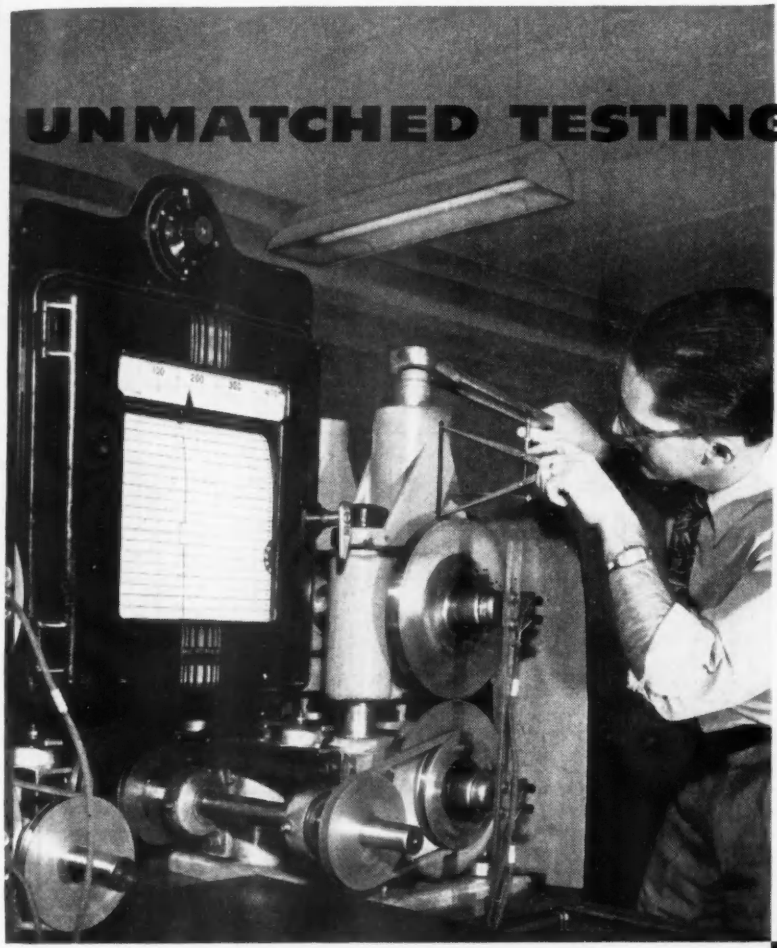
$$R = k \frac{W^n}{D^3}$$

For example, 9000 pounds in 9-inch hole is 1000 pounds per inch; and 18,000 pounds in 12¼-inch hole is 1470 pounds per inch. We would then expect the 12¼-inch bit with 18,000 pound weight to drill 1470 ÷ 1000 = 1.47 times faster than a 9-inch bit with 9000-pound weight. With this respect better results would be obtained with 11¼-inch drill collars in 12¼-inch hole than with 10½-inch drill collars in the same hole.

Finally, analyze the effect of changes of clearance. If 4500-pound weight is carried on 6¼-inch drill collars in a 7⅛-inch hole instead of a 9-inch hole, the inclination would be 3½ degree (point E) instead of 2¾ degree (point A), which means that for less clearance the inclination is greater. The influence of the clearance would be greater for much smaller clearances such as ¼-inch (point G) for which the inclination would reach 5 degrees. This finding, which, it should be remembered, is for beds inclined 30 degrees is quite unexpected.

The use of many stabilizers in the lower portion of a string of drill collars is approximately equivalent to a decrease of clearance between collars

UNMATCHED TESTING FACILITIES...



one of many reasons for Hyatt leadership!

In testing laboratory or manufacturing plant, Hyatt's facilities are second to none. Continuing research in methods and materials, and exacting inspection with the finest in modern equipment, has made the Hyatt name a synonym for "highest quality." That's why Hyatt Roller Bearings are so widely used by manufacturers of oil field equipment. Their design engineers know that Hyatt bearings reduce maintenance costs and shut-downs because they last longer under continuous heavy-duty operation. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

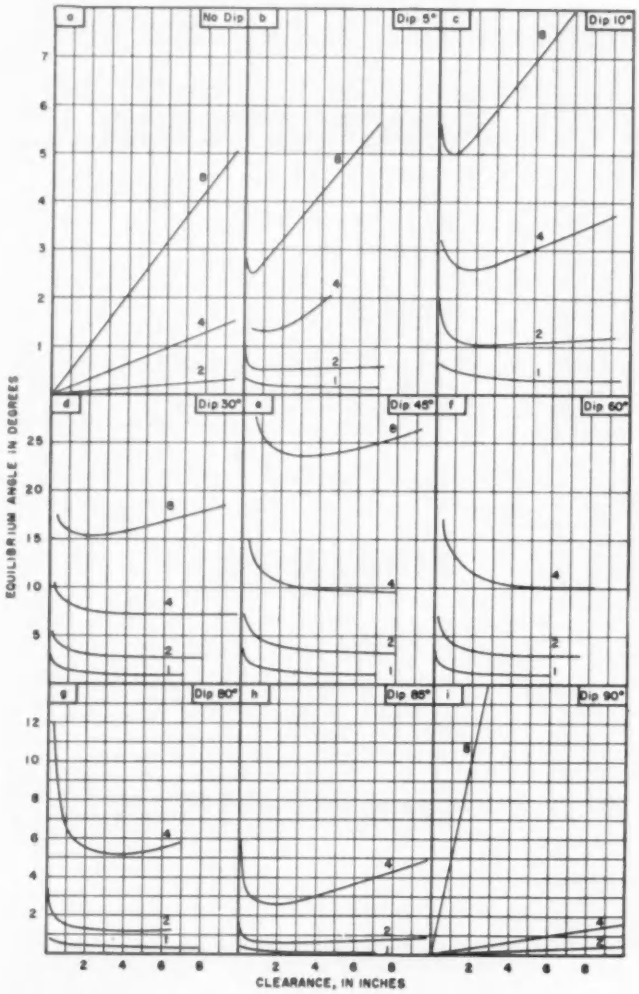


Fig. 9—Inclination toward which the hole tends (equilibrium angle) in slanting formations. Anisotropy index h = 0.025. Number on each curve is weight on bit in dimensionless units. (See table in Figure 11).

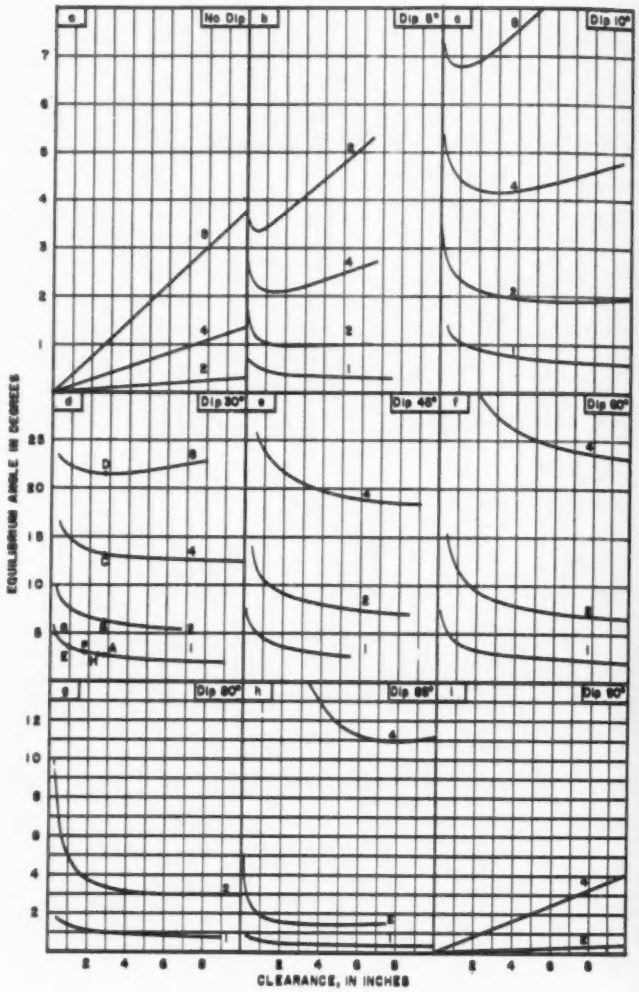


Fig. 10—Inclination toward which the hole tends (equilibrium angle) in slanting formations. Anisotropy index h = 0.050. Number on each curve is weight on bit in dimensionless units. (See table in Figure 11).

and hole without changing collar size. It appears then that in this example, in which the beds have a dip of 30 degrees, the use of stabilizers would result in an increase of angle of inclination. (It must be remembered that here only equilibrium angle of inclination is considered. The advantage of stabilizers in preventing rapid changes of angle will be discussed later.)

The conditions of the foregoing example approximate pretty well drilling conditions in those areas of Southern Oklahoma, Wyoming and elsewhere where the dip of the formations is between 25 and 45 degrees.

The conclusion concerning the foregoing example is that for the conditions under consideration, there are two means of performing cheaper drilling, viz.:

1. Increase of the weight on the bit and deliberate drilling of more inclined holes (see "A" and "B" following). The advantage of the method in some wildcats is the increased probability of discovery because of the updip drift of the bit. On the other hand, the appreciable horizontal distance between surface and bottom location of wells may not be allowed by present state laws, or may be inconvenient in small leases. For large leases, it has already been proposed that surface locations may be made so as to bottom the wells as desired.[2]
2. Use of larger drill collars, which allow carrying more weight on the bit, without increasing hole inclination (see "C" below). The authors of this paper recommend 8-inch or 8⅛-inch drill collars in 8¾-inch and 9-inch holes, which are already being used. Furthermore, the use of still larger collars, such as 10½ inches to 11¼ inches in 12¼-inch hole should be tried.

The above two means, which may also be used jointly (see "D" below) are confirmed by the following field data:

A. R. B. McCloy, in a paper presented in 1952,[3] reported savings of $10,000 to $30,000 obtained in Carter County, Oklahoma, by carrying more weight and allowing the well inclination to reach 7 degrees.

B. Wesley W. Moore in the discussion of the same paper reported a well in Fremont County, Wyoming, in which the weight had to be maintained under 11,000

Erratum

The abscissa to Figure 6 should have read "weight on bit in dimensionless units." This was omitted from the illustration on Page 140 of the July issue of WORLD OIL.

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MAGCOGEL
100% PURE WYOMING
BENTONITE
FOR OIL WELL DRILLING
COLLOIDAL, GEL-FORMING WALL BUILDING MATERIAL
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IS MORE ECONOMICAL
• Only a little Magcogel mixed with water provides a mud with the proper viscosity for rapid removal of cuttings from the bit and adequate gel strength for suspending the cuttings when circulation is interrupted. It forms a thin impervious filter cake on porous formations which prevents loss of mud and seals the hole.
. . . BECAUSE IT DISPERSES QUICKLY
. . . BECAUSE IT HYDRATES QUICKLY
. . . BECAUSE IT GIVES MORE BARRELS PER TON
. . . BECAUSE IT IMPROVES WALL BUILDING PROPERTIES OF THE MUD
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DRILLING MUD SERVICE
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ACTUAL PHOTOGRAPH OF MAGCOGEL MUD

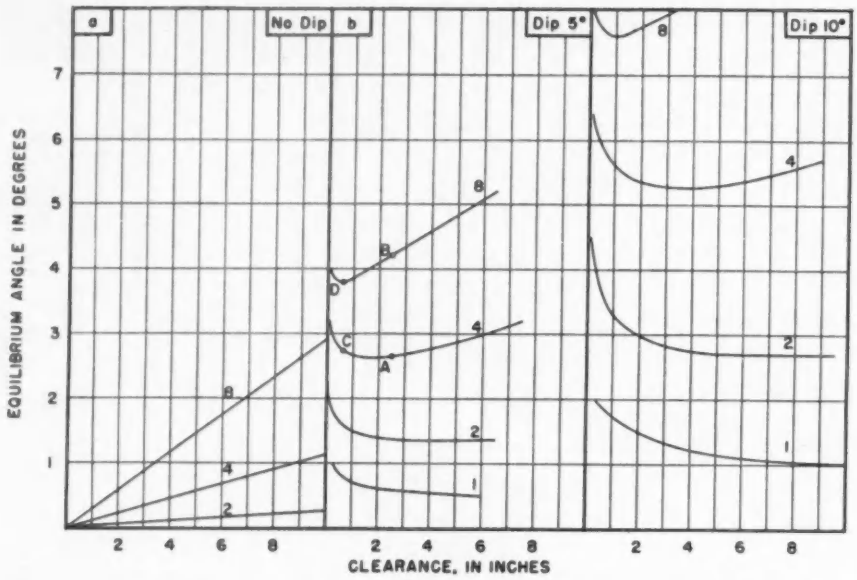


Fig. 11—Inclination toward which the hole tends (equilibrium angle) in slanting formations. Anisotropy index h = 0.075. Number on each curve is weight on bit in dimensionless units.

Conversion of Dimensionless Units of Weight Into Pounds

	DIMENSIONLESS UNITS			
	1	2	4	8
4½" Drill Pipe	750 lb.	1,500 lb.	3,000 lb.	6,000 lb.
6¼" Drill Collars	4,500 lb.	9,000 lb.	18,000 lb.	36,000 lb.
8⅛" Drill Collars	9,000 lb.	18,000 lb.	36,000 lb.	72,000 lb.
10½" Drill Collars	18,000 lb.	36,000 lb.	72,000 lb.	.....

pounds, with corresponding penetration rates of 22 to 24 feet per day, in order to keep the inclination below 5 degrees. Later, it was learned from oriented cores that the course of the hole was updip; and, inasmuch as this was a wildcat well on a large lease, the weight was increased to 33,000 pounds. The inclination reached 17 degrees and the resulting rate of penetration became 75 feet per day. The resulting estimated saving in this 14,000-foot well was $85,000.

C. W. M. Booth[4] reported at a meeting of the API Mid-Continent Study Committee on Bore-Hole Drift the drilling performance of many holes drilled in Sholem-Alechem field of Oklahoma with 6¼-inch drill collars and 8-inch drill collars. With 10,000 to 20,000 pounds and 8-inch drill collars, the same average inclination of 2½ degrees at the bottom of the hole was reached as with 2000 to 10,000 pounds and 6¼-inch drill collars. The large drill collars resulted in a saving of about ⅓ in drilling time.

D. The writers of this paper know of a well in Wyoming in which 30,000 pounds were carried with 8-inch drill collars in 9-inch hole. Fifteen degrees of inclination were reached. Conventional practice in the same field is to drill with 6¼-inch drill collars and 8000-pound weight in order to keep the inclination small. The new method resulted in drilling progress of 100 feet per day as compared to 35 to 40 feet per day by conventional methods.

Example 2. Now study another set of field conditions in which, with 6¼-inch drill collars in 8¾-inch hole, 5-degree angle of dip, and 20,000-pounds weight, a 3-degree hole angle is maintained. These conditions are approximately met by the point A, Figure 11b, which indicates 2¾-degree inclination for four dimensionless units of weight (18,000 pounds for 6¼-inch drill collars) and 2½-inch clearance.

If the weight were doubled to 36,000 pounds the hole angle would increase to 4¼ degrees (point B). If, on the other hand, 8⅛-inch drill collars were used instead of 6¼-inch and 36,000 pounds carried, the hole angle would become 2¾ (point C). Finally, if 72,000 pounds were carried on 8⅛-inch collars, the hole angle would become 3¾ degrees (point D). To investigate the effect of hole clearance alone, consider 6¼-inch drill collars with 36,000 pound weight and clearances equal to 2½ inches (point B) and ⅝ inch (point D) for which inclinations are 4¼ degrees and 3¾ degrees respectively. This means that for less clearance the hole deviation is smaller, which is the reverse of the situation analyzed in the previous example for 30-degree dip. The effect of clearance on hole inclination increases as dip angle decreases. In the limiting case of zero dip, i.e. horizontal formations, Figures 9a, 10a, and 11a show that the angle of inclination increases very fast with clearance and is, in fact, proportional to the clearance. For this reason, in the case of horizontal beds or isotropic formations previously investigated in this article, inclinations per inch of clearance were given, as in Figure 7. (See Part 1.) From inspection of curves of Figure 11b, it is seen that the angle of inclination increases with the clearance only for the upper curve, i.e., for the highest weight.

The conditions of this last example correspond to crooked hole territories in West Texas. W. S. Bachman and H. M. Rollins reported in a paper[5] the success attained by use of stabilizers in West Texas for weights as high as 50,000 pounds on 8¾-inch bits.

Highly Inclined Beds. In Figures 12 and 13 the angle toward which the hole tends, i.e. the equilibrium angle, is plotted vs. the formation dip for a clearance between the collars and the hole equal to 2.75 inches. These figures are for anisotropy indices of 0.025 and 0.050 respectively.

These drawings will be used to investigate the influence of very inclined beds.

Point A of Figure 13 shows that for 20-degree dip, the inclination would be 14 degrees for a weight on bit of eight dimensionless units or 36,000 pounds for 6¼-inch drill collars. Although high, this inclination is not unreasonable.

Following the curve for the same

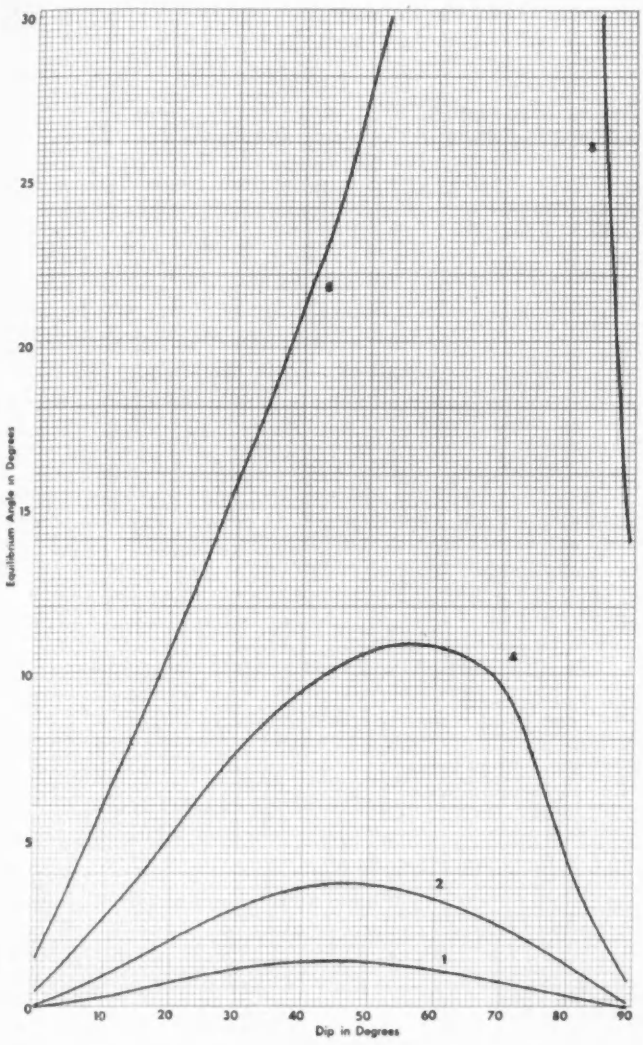


Fig. 12—Equilibrium angle vs. formation dip. Anisotropy index h = 0.025. Clearance = 2.75 inches. Numbers on curves refer to weight on bit in dimensionless units. (See conversion table in Figure 11).

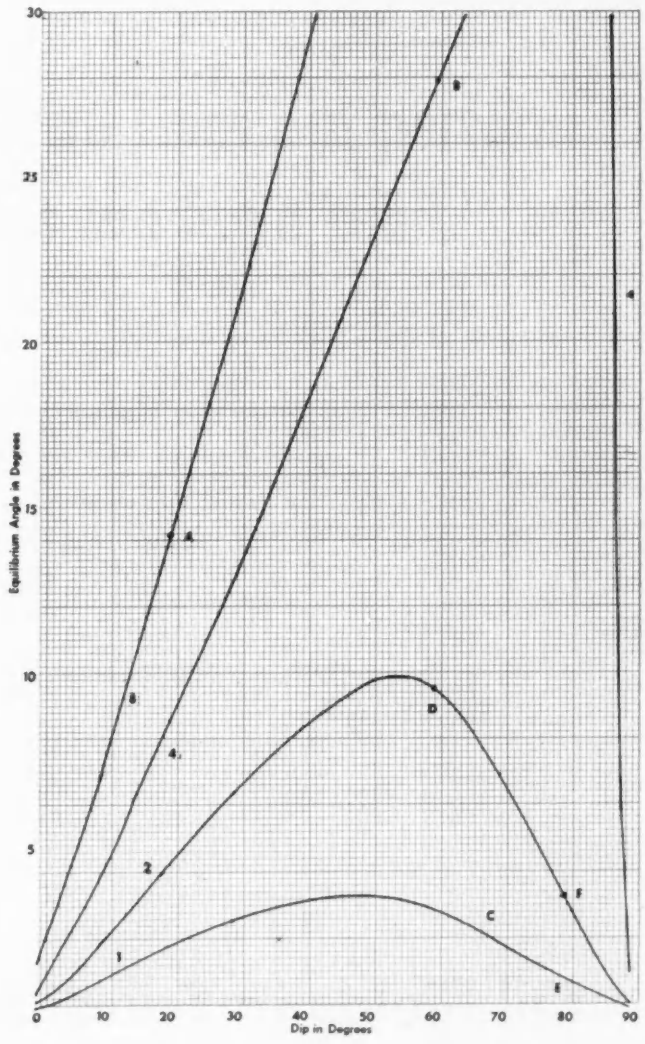


Fig. 13—Equilibrium angle vs. formation dip. Anisotropy index h = 0.050. Clearance = 2.75 inches. Numbers on curves refer to weight on bit in dimensionless units. (See conversion table in Figure 11).

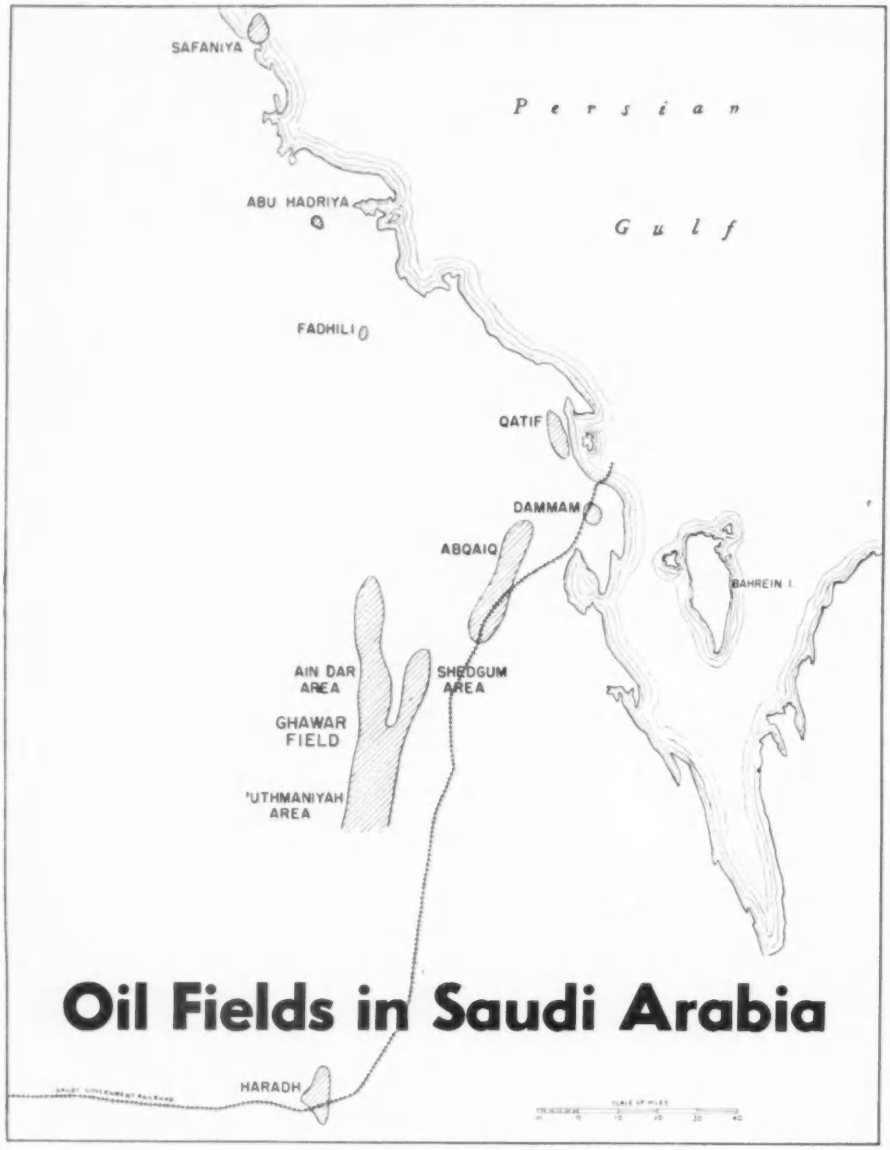
weight, it is found that for 60-degree dip, the equilibrium angle is some value far off scale and altogether unacceptable. Point B shows that even with four dimensionless units of weight (18,000 pounds for 6¼-inch collars) the hole angle is 28 degrees. In such beds, only weights corresponding to 1, 2, or slightly more dimensionless units may be considered. The only possibility of carrying more weight without exceeding reasonable inclination is to use larger drill collars. The inclination obtained with 4500-pound weight and 6¼-inch drill collars, 3 degrees (point C) would also be obtained with 9000 pounds with 8⅛-inch collars or 18,000 pounds with 10½-inch collars. Doubling these weights would result in an angle of 10 degrees (point D).

It is interesting to note that for still steeper formations, the above mentioned weight would lead to smaller angles of inclination; e.g., 1 degree (point E) and 3½ degrees (point F), respectively, for an 80-degree dip. On the other hand, for larger values of weight the deviation would still be off scale.

As already stated, Figure 13 is for a clearance of 2.75 inches which is the clearance for 6¼-inch collars in 9-inch holes. Small errors will be made when these charts are used for oversized collars. More correct values might be obtained by using Figure 10.

Note concerning Figures 9, 10, and 11—The abscissa in Figures 9, 10 and 11 is the clearance between the drill collars and the hole. In the examples, this abscissa was used for any size of collars. Actually, this scale is correct only for 6¼-inch collars; and, if used for 8⅛-inch or 10½-inch collars, the readings should be multiplied by 1.189 and 1.414 respectively. For instance, in Example 1 the case of 18,000-pound weight, 10½-inch collars in 12¼-inch holes was analyzed and point F (clearance 1¾ inches) of Figure 10d was taken as representing these conditions. Actually, a clearance of 1¾ inches for 10½-inch collars corresponds to a clearance of $1.75 \times 1.414 = 2.475$ inches of the abscissa scale. Consequently, actual conditions are represented by point H instead of point F, which means that the hole inclination is 2¾ degrees instead of 3 degrees, which is a small error. In most cases, this error is still smaller; and, for this reason, a complication of providing Figures 9, 10 and 11 with three abscissa scales for various collars was not deemed necessary.

(This is the second of a three-part article. The concluding installment will appear in the September issue of WORLD OIL. A complete list of references, bibliography and acknowledgment appeared with Part 1 in the July WORLD OIL.)



. . . . They're Overcoming Drilling Problems

- By using a floating mud cap to prevent lost circulation.
- By running and cementing five strings of casing.

By L. C. CARSON, Petroleum Engineer,
Arabian American Oil Company, Dhahran, Saudi Arabia

IN THE GHAWAR FIELD of Saudi Arabia five strings of casing are run and cemented in almost every well before pay is encountered. And at one stage in the drilling, a mud cap is spotted in the annulus to prevent lost returns and then the cuttings are pumped into a "thief" formation while drilling goes ahead.

The average depth to the top of the pay member is 6800 feet and its total thickness is about 280 feet. Usually a 30-inch conductor is run to 100 feet; a string of 18⅝- or 20-inch casing is cemented to 600 feet; 13⅜-inch at about 2600 feet; 9⅝-inch at about 4300 feet; and 7-inch just about the pay member. A 2⅞-inch tubing string is hung 15 feet off bottom. See Figure 1 for data on a typical well in the Ghawar field.

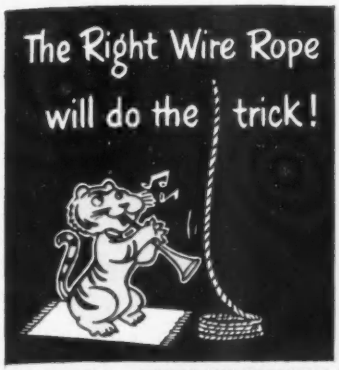
All productive zones that have been encountered in the various Saudi Arabian oil fields are of calcareous rock except at Safaniya, where the producing section is sand. Total depth of wells at Safaniya is about 5500 feet and four strings of casing are employed in the completion. The 7-inch oil string is cemented at total depth and perforated through the pay intervals.

Surface Hole. In the Ghawar field the wells are spudded using water or light gel mud as a drilling fluid, and circulation generally is lost at 200 to 300 feet. A 26-inch hole is drilled to about 600 feet where 20-inch casing is cemented to obtain a shutoff between various fresh and/or salt water aquifers.

When a well location is such that surface sand is found to a considerable depth, one or two joints of 30-inch line pipe are cemented. On rare occasions, circulation has been lost before the 30-inch pipe was run, and as a result the sand and concrete cellar have caved from under the rig. A considerable amount of filling with rock and cement has been required to fill the caved area, save the rig, and reestablish the hole.

Top Hole. A 17½-inch hole is drilled from the 20-inch casing shoe to about 2600 feet. Water is used as a drilling fluid and returns are lost in the porous limestone which is encountered at about 800 feet. A shale section is encountered at about 2300 feet, and 300 feet of this shale is penetrated to reach the 13⅜-inch casing depth. The drilling of this shale with water is seldom troublesome; however, it is necessary on occasion to wash the 13⅜-inch casing through all or a portion of this shale to reach the drilled depth before cementing.

Intermediate Hole. A 12¼-inch hole is drilled from 2600 feet to 4300 feet employing a bentonite, pyrophosphate-quebracho treated,



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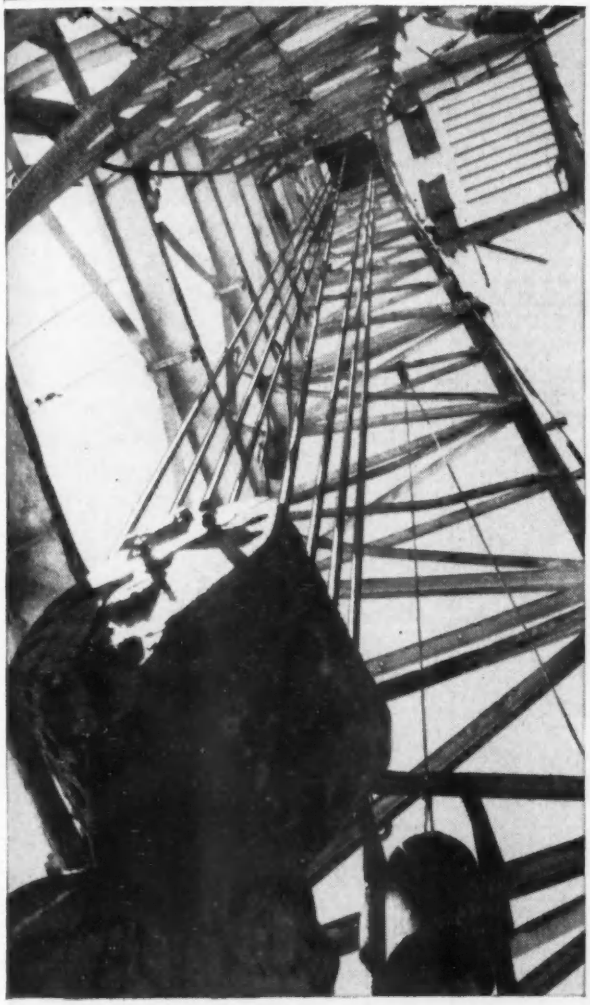

That's Bruce Harp talking— West Texas Drilling Superintendent for Exploration Drilling Co. Here's what he says about American Tiger Brand Wire Lines: "We keep accurate ton-mile records and we know what each one of our lines has done. We've used almost every kind of wire rope there is, but I'll say that American Lines give us the best service of any."

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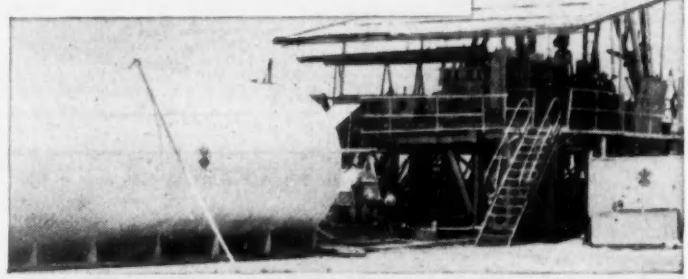

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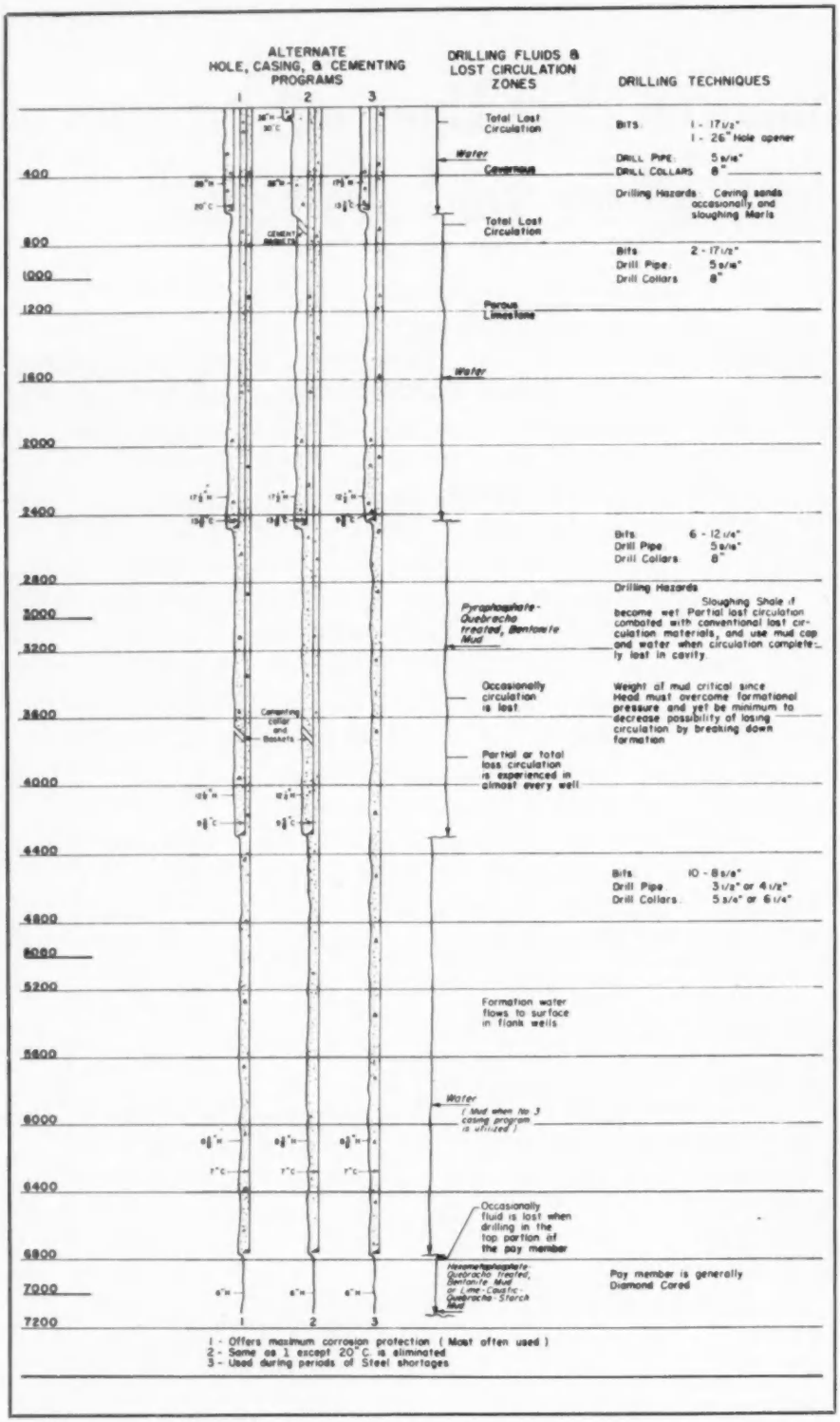
ALTERNATE HOLE, CASING, & CEMENTING PROGRAMS
1
2
3
DRILLING FLUIDS & LOST CIRCULATION ZONES
DRILLING TECHNIQUES
Total Lost Circulation
Water
Cavernous
Bits: 1 - 17½"
1 - 26" Hole opener
DRILL PIPE: 5 a/s"
DRILL COLLARS 8"
Drilling Hazards: Caving sands occasionally and sloughing Marls
Total Lost Circulation
Bits 2 - 17½"
Drill Pipe: 5 a/s"
Drill Collars 8"
Porous Limestone
Water
Bits 6 - 12¼"
Drill Pipe 5 a/s"
Drill Collars 8"
Drilling Hazards
Sloughing Shale if become wet. Partial lost circulation combated with conventional lost circulation materials, and use mud cap and water when circulation completely lost in cavity.
Pyrophosphate-Quebracho treated, Bentonite Mud
Occasionally circulation is lost
Weight of mud critical since Head must overcome formational pressure and yet be minimum to decrease possibility of losing circulation by breaking down formation
Cementing collar and Baskets
Partial or total loss circulation is experienced in almost every well
Bits 10 - 8 a/s"
Drill Pipe 3½" or 4½"
Drill Collars 5 a/s" or 6¼"
Formation water flows to surface in flank wells
Water
(Mud when No. 3 casing program is utilized)
Occasionally fluid is lost when drilling in the top portion of the pay member
Hexametaphosphate-Quebracho treated, Bentonite Mud or Lime-Caustic-Quebracho-Starch Mud
Pay member is generally Diamond Cored
400
800
1000
1200
1600
2000
2400
2800
3000
3200
3600
4000
4400
4800
5000
5200
5600
6000
6400
6800
7000
7200
1 - Offers maximum corrosion protection (Most often used)
2 - Same as 1 except 20° C. is eliminated
3 - Used during periods of Steel shortages

Fig. 1—Data for typical well in Ghawar field.

mud. In most wells, the weight of the mud is extremely critical when drilling this section of the hole, since it must be maintained at a low weight so as not to break down the formations and thereby lose circulation; yet it must possess a sufficient density to overcome the head of the formation fluid.

After drilling through the shales below the 13⅜-inch shoe, a section of predominantly unconsolidated sand is penetrated. Occasionally circulation is lost in this sand section. Below this sand is a 200-inch section of cavernous dolmite, and circulation almost always is partially or totally lost while drilling in this horizon. If a large cavity is not encountered, returns are generally regained by use of conventional lost circulation materials. When a large cavity is encountered, a floating mud cap and water is employed in drilling through the dolmite and 300′ into the underlying shale to the 9⅝-inch casing depth. The floating mud cap in the annulus above the lost circulation zone serves three purposes: one, to furnish a sufficient head to prevent the shales from caving; two, to furnish a hydrostatic head to overcome the formation fluid head; three, to prevent the rise of formation and circulating waters above the lost circulation zone to a level where they would wet exposed shales. When these shales, below the 13⅜-inch shoe, become wet, they slough badly. The water, which is circulated down the drill pipe, carries the cuttings into the lost circulation zone below the mud cap.

In the event that the mud cap commences to "pump off" (or returns are regained) due to the cuttings filling the lost circulation voids, or other reasons, it is necessary for the driller to switch from water to mud immediately in order to minimize the wetting of the exposed shales. On drilling ahead, circulation again may be lost and a mud cap and water again used. This cycle of regaining and losing circulation may occur several times before the 9⅝-inch casing depth is reached, and the driller must be always alert to switch from mud to water and mud cap, and vice versa.

The 9⅝-inch casing is cemented to the surface either by a single or two-stage job, depending upon the difficulty which was experienced in maintaining full circulation while drilling. A two-stage collar is utilized when two-stage cementing is employed.

Lower Hole. An 8⅝-inch hole is drilled from the 9⅝-inch casing shoe into the anhydrite section above the pay. Water is used as a drilling fluid, and on flank wells the formation water flows to the surface. This is brackish water and is not recirculated. The water is displaced with mud prior to the running of the 7-inch casing, and this casing is cemented to the surface as a protection against corrosion.

The types of formation encountered in this section of the hole are mainly

Wire Rope at Work—Near Hazleton, Pa., lie rich seams of anthracite coal which in places are not far below the surface of the ground. The dragline excavator shown here, owned by A. E. Dick Contracting Co., is getting at the coal by stripping off overburden—the cover of earth that is about 120 ft in thickness at this particular point.

Using a 22-yd bucket, the excavator can scoop up thousands of cubic yards of dirt and rock per day. It works 'round the clock, with only minor interruptions. This mechanical mastodon is fitted throughout with Bethlehem Wire Rope, including twin draglines and hoist lines, visible in the picture as they handle the bucket. A typical assignment, the kind of rough, tough job entrusted to Bethlehem rope in every type of industry, wherever there is heavy lifting or hauling to be done.

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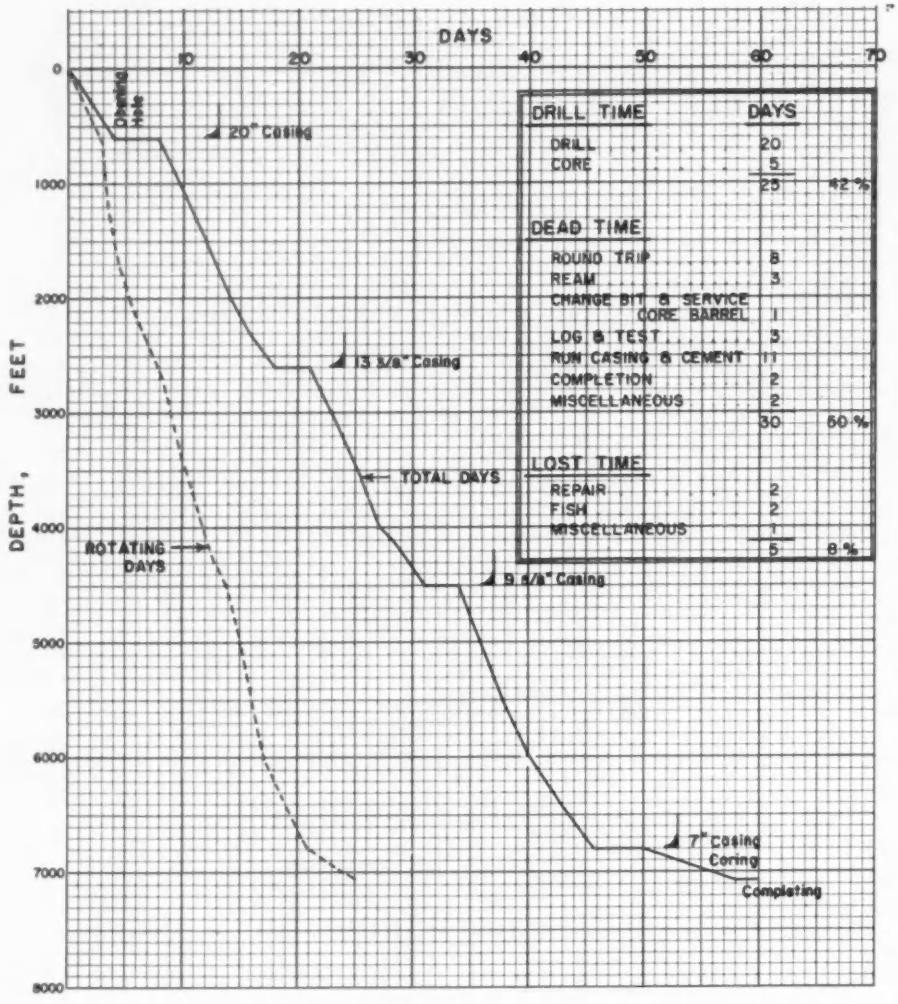

Fig. 2—Drilling time chart of typical well in Ghawar field.

TABLE 1

A Typical Ghawar Development Well Bit Record

Bit No.	Bit Size	Footage	Hours	Footage /Hour	Rotary Speed RPM	Weight (1 000 Lbs.)	Pump Pressure (psi.)	Drilling Fluid
1	17½"	1,093	56	19	55	15	100	Water
2	12½"	619	40	15	55	15	100	Water
3	17½"	696	48	15	55	12	100	Water
4	26" (Hole Opener)	660	60	....	....	....	....	.....
5	12¼"	444	32	14	55	16	250	Bentonite (phosphate-quebracho treated)
6	12¼"	446	28	16	55	16	250	" "
7	12¼"	399	27	15	55	20	300	" "
8	12¼"	257	29	9	55	20	275	" "
9	12¼"	194	20	10	55	20	275	" "
10	12¼"	90	6	15	55	18	250	" "
11	8⅝"	318	25	13	55	10	800	Water
12	8⅝"	252	19	13	55	12	750	Water
13	8⅝"	225	17	13	55	14	575	Water
14	8⅝"	338	17	20	55	16	700	Water
15	8⅝"	296	20	15	55	14	650	Water
16	8⅝"	211	19	11	55	16	700	Water
17	8⅝"	258	25	10	55	15	700	Water
18	8⅝"	252	20	12	55	15	750	Water
19	8⅝"	190	15	13	55	16	750	Water
20	8⅝"	80	8	10	55	14	550	Water
	.....	6,658	471	14	....	....	....	.....

SUMMARY

Bit Size	No. of Bits	Total Footage	Total Hours	Average Penetration Rate (Ft./Hr.)
17½"	3	2,408	144	17
12¼"	6	1,830	142	13
8⅝"	10	2,420	185	13

sandstone, limestone (both dense and porous), and anhydrite.

Pay Member. The pay member is diamond cored in approximately every second well. On many wells 100 percent core recovery is obtained. A bentonite-barytes, hexametaphosphate and quebracho treated mud is generally used. A lime-caustic-quebracho-starch mud is utilized occasionally.

Selected wells are cored with an oil base mud in order to obtain suitable cores for water saturation determinations. Wells which penetrate the oil-water contact are occasionally cored with oil base mud also.

Because of the high well potential and rock permeability, it is not necessary to acidize the pay member in the Ghawar or Abqaiq fields. However, increased production has resulted from the acidizing of wells of lower potential in two of the presently producing fields (Qatif and Damman).

After 2⅞-inch tubing is hung about 15 feet off bottom, the well is brought-in by displacing the mud with water and is flared until clean.

Bit Rates of Penetration. Approximately 20 bits are used in drilling to the 7-inch casing depth. Most of the hole is drilled using water as a circulating fluid. The rate of penetration has been increased nearly 50 percent since the use of water in drilling the 8⅝-inch hole was inaugurated.

Table 1 shows the actual bit record of a development well. All the bits used in this well were rock bits. On most rigs 8-inch drill collars and 5⅝-inch drill pipe are utilized in drilling the 17½-inch and 12¼-inch holes; 5¾-inch drill collars and 3½-inch drill pipe are used in drilling the 8⅝-inch

TABLE 2

Data From a Well Cored in the Ghawar Field

Core No.	Interval Feet	Average Core Rate Ft./Hr.	Footage Recovery Feet	Percent Recovery
1	6723–6775	2.8	46	88
2	6775–6832	2.7	57	100
3	6832–6889	3.2	57	100
4	6989–6937	3.9	48	100
5	6937–6994	4.3	57	100
6	6994–7051	4.5	57	100
Total....	6723–7051	3.5	322	98

hole. However, as the 5 9/16-inch and 3½-inch drill pipe strings are retired, they are being replaced with 5-inch drill pipe. On rigs equipped with 5-inch drill pipe, this pipe is employed in drilling from the surface to the 7-inch casing depth, and 2⅞-inch tubing, fitted with tool joints, is being used to drill or core the pay section. Drill collars of 8-inch outside diameter are being utilized in conjunction with the 5-inch drill pipe in drilling the 17½-inch and 12¼-inch holes, and 6¼-inch outside diameter drill collars are being used in drilling the 8⅝-inch hole. Increase in the rate of penetration in the lower hole is noted from the employment of the larger drill pipe and drill collars. Also, the necessity for reducing the drill pipe size after setting the 9⅝-inch casing is eliminated.

It will be noted from Table 1 that in drilling the 12¼-inch and 8⅝-inch holes, the average weight per bit is slightly less than 2000 pounds per inch diameter of the bit. These weights have been found to be optimum weights to carry on the bits. Experiments with added drill collars (increased weights and slower rotating speeds) have resulted in a decrease in bearing life of the bit and an increase in the round trip time (due to the handling of the extra drill collars).

A limited number of 12¼-inch and 8⅝-inch jet bits have been run, and when these bits have been used in conjunction with 5-inch drill pipe, a substantial increase in the rate of penetration has been obtained. Presently experiments are being run on various types of jet bits in different formations.

Coring. All coring of the limestone pay member is performed by utilizing diamond coring equipment. Excellent results have been obtained in using a 6-inch diamond bit on a 5¾-inch O.D. and 3⅝-inch I.D. barrel. A 4¾-inch O.D. x 2⅝-inch I.D. barrel utilizing a 5¾-inch bit was used in a number of wells.

Table 2 shows the core data taken from a well cored in the Ain Dar field.

Drilling and Completion Time. Although a few wells are completed in 45 days, the average drilling and completing time is 60 days. Figure 2 is a typical drilling time chart.—**The End.**

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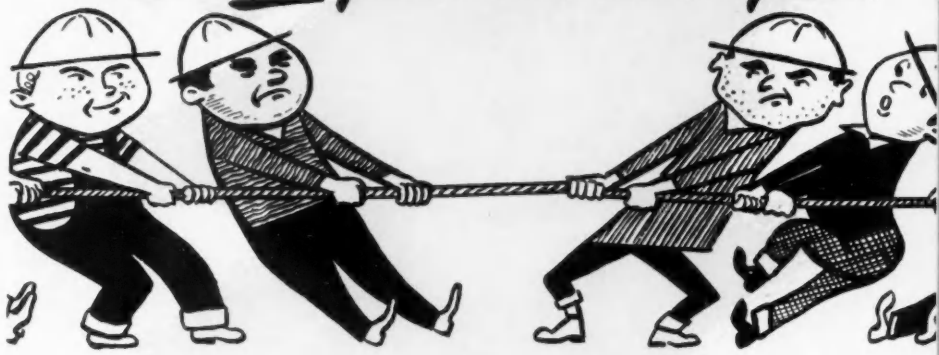

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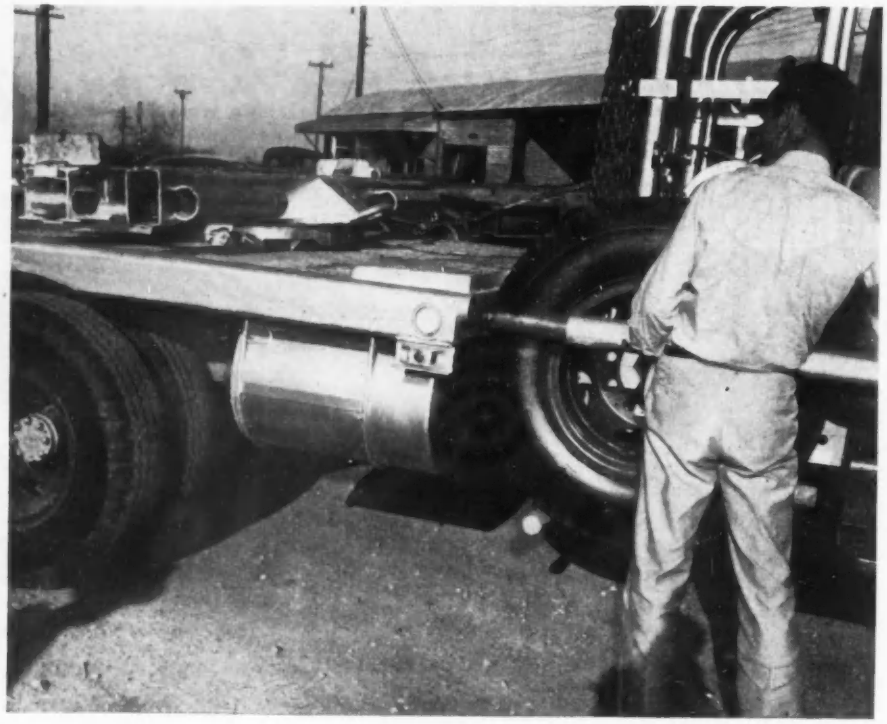


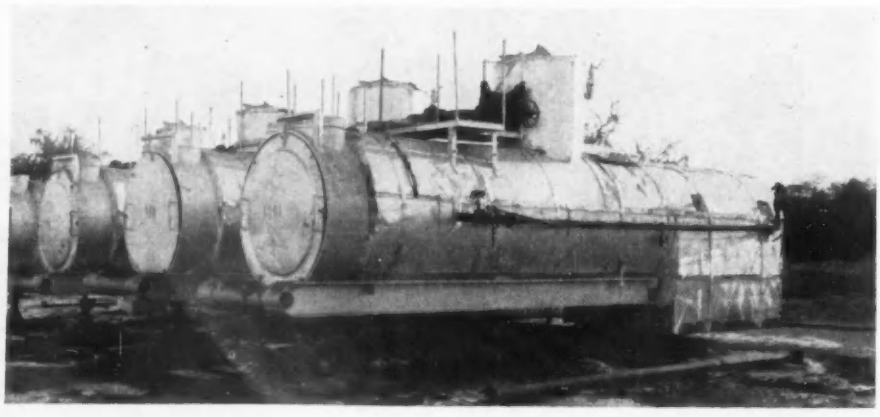
Photo courtesy of Gulf Safety News

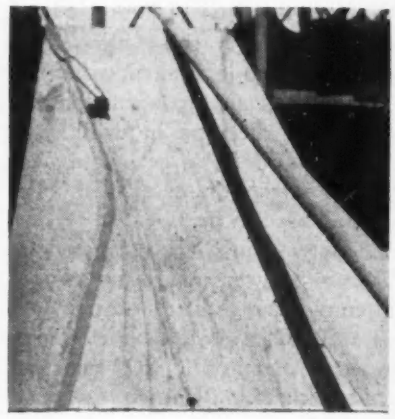
Mounting Spare Tires for Safe Removal

The problem of mounting spare tires on heavy duty trucks was licked in a Gulf Oil Corporation safety meeting when a labor-saving idea made it possible to easily and safely remove and install heavy tires.

Previously the tire was mounted on top of the headache post behind the truck's cab, and usually required the combined effort of two men to get it to the ground. Extreme caution was necessary to prevent injury to those handling the huge tire.

Today, the tire is mounted on the side of the truck in a much improved and accessible position. One man can easily remove the tire from its mounting. He removes the piece of ginpole (as shown), loosens the bolt holding the tire in place and eases the 250 pound tire to the ground. A couple of two-inch steel rods welded to the frame form a support onto which the tire may rest until bolted into position. A handle is welded on the truck cab to assist in lifting and climbing around the truck.





Guiding Pipe on Ramp

When making up or breaking down strings of pipe, it is necessary to transfer the length of drill stem or tubing from the derrick floor to the pipe racks. Sometimes during this operation the pipe slides off the pipe ramp, causing time delay, damage to the pipe, and danger to anyone standing nearby.

Weld an angle to the ramp, as shown in the illustration, to keep the pipe from sliding off.

Prevent Boiler Damage

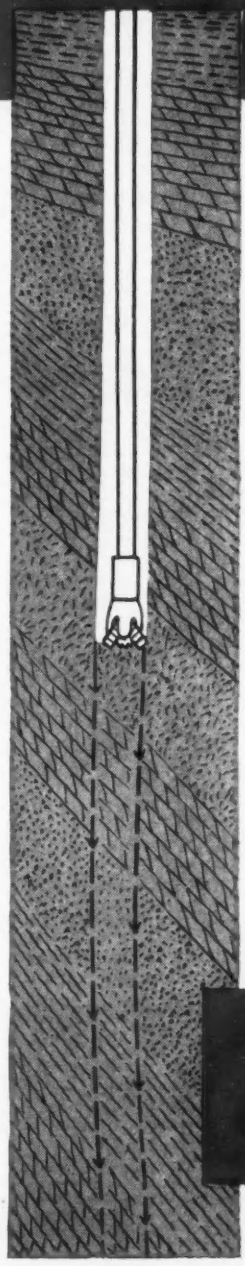
Skids on insulated boilers prevent damage to the insulation during moving operations. It has been found that with the increase in the price of natural gas, the insulation pays off, but the trailer bolsters soon damage the insulation.

Skid mounts bolted to the base of the flues provide a good rest for the boilers on the trailer bolsters and prevent damage to the insulation. Bolted to the boilers, they provide a support for the jack at the back of the boiler when on location.

When it is necessary to move the boilers, the back end is raised and the trailer put under the skids. The front end of the boiler is then raised by means of the winch line and carried against the back of the truck, care being used to place planks between the insulation and the winch line.

"Straight" hole going off vertical? Too *much* angle in your directional well?

Breaking the angle is easy with this NEW "Shoulder" Bit!



here's how:

A Use the new H. C. Smith "Shoulder" Bit

B ... with light weight on the bit

C ... and high rotary speed

This method really works! Just ask the many operators, from California to the Gulf Coast, who've used this new H. C. Smith bit for the past several months to correct hole deviation. The results have been excellent in one oil field after another, under a wide range of conditions.

Here's how the new "shoulder" bit works. Two exclusive features do the trick — extra clearance of the body above the gauge cutters, and the straight-across angle of the gauge cutter teeth (see the arrows). This flat contact on bottom quickly forms a new profile on the low side of the hole — the extra clearance between body and cutters insures against deflection toward the old axis of the hole. The combination breaks the angle easily and gradually — result, hole back on its intended course.

The new "shoulder" bits have given good results both in straight holes which have established an increasing angle, and in directional wells where the deviation has exceeded the planned angle. Available in sizes 8⅜ to 12¼". Sizes 8⅜ - 9⅞ are supplied only with 4½" A.P.I. pin. This bit is recommended *only* for use with light weight.

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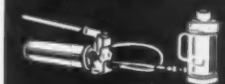

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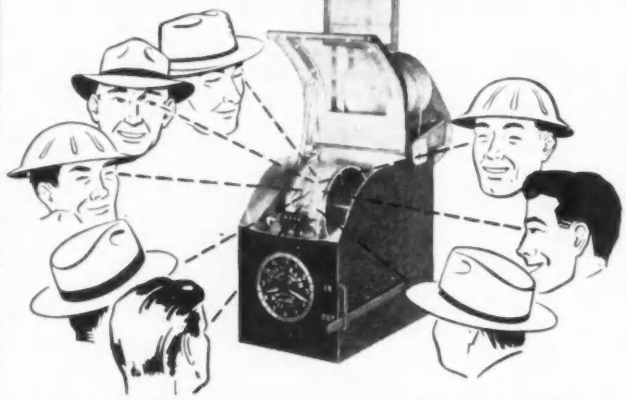
This simple method of hooking up the mud pump with a manifold will save time on rigging up and rigging down.

Weld a four-inch piece of pipe across the front of pump skid base with a blank plate in the middle. This piece forms the strength for the front of the pumping unit, and carries two quick-acting unions, one on each end.

Then union up the pump discharge to either side of the blanked off place in the header with a valve on each side. In operation, as soon as the unit has been spotted at the well site, the mud line from the rotary hose is connected to the union shown at the right in the foreground, and the other union is hooked to the casing side of the well in workover rigs and to the jetting lines in normal drilling.

Also shown, is the half of the quick-acting union used on the suction to connect to the water line when drilling is first commenced and also for compounding with another pump when it is necessary to break down the formation or when it is necessary to kill a well.

EVERYBODY...



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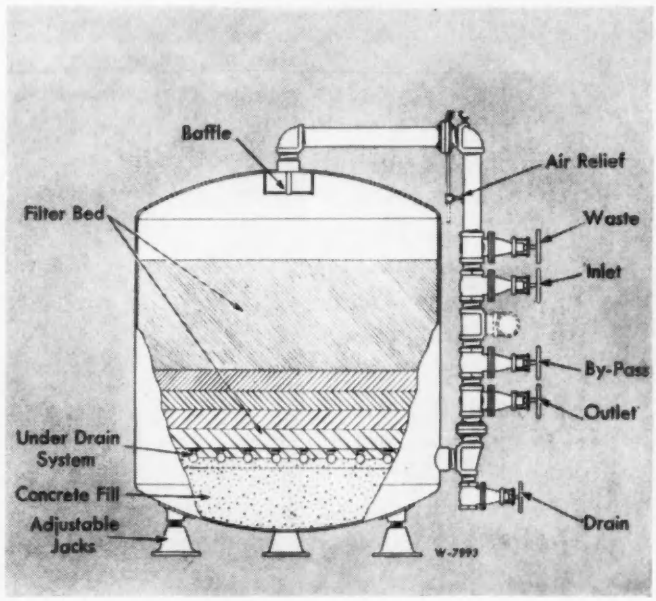
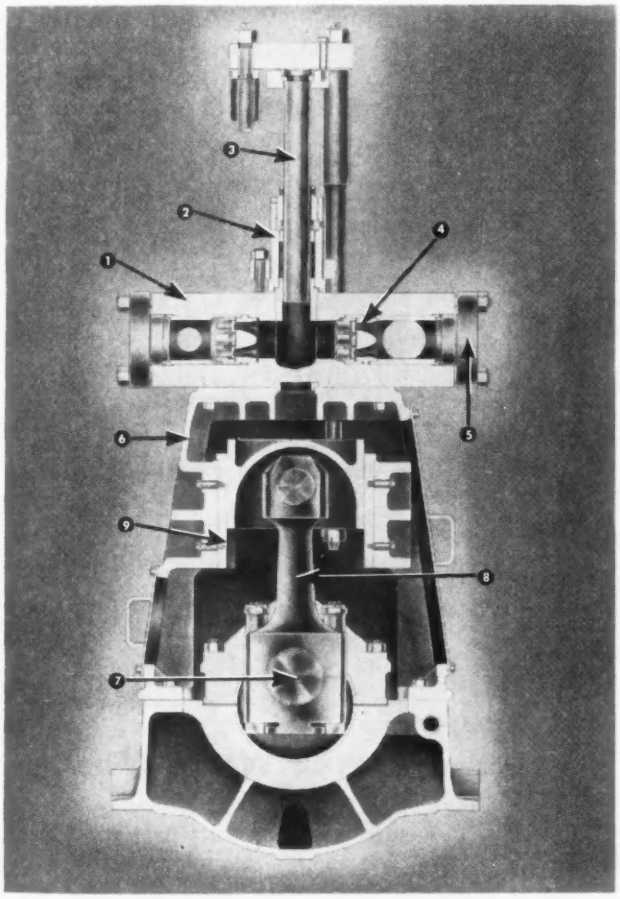
PRESSURE FILTERS. Water containing suspended matter or dissolved impurities which have a tendency to deposit and seal off the producing sands can cause the failure of a water flooding system. Worthington Pressure Filters, sometimes assisted by coagulation or special chemical treatment, are especially adapted to oil recovery service with particular emphasis given to fine filtration and economy in backwash water. Write for Bulletin W-212-B3.



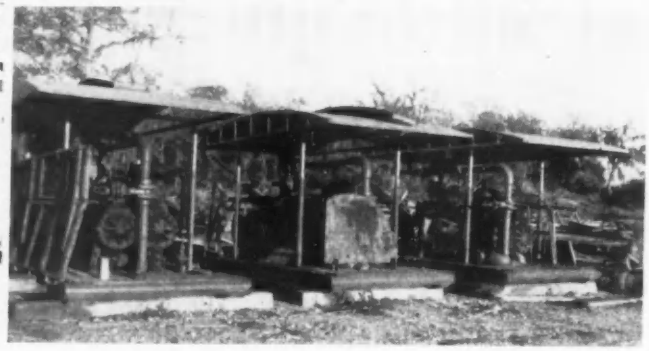


NEW MULTI-PLUNGER POWER PUMP. For the large water floods, this new Worthington heavy-duty multi-plunger pump is the ultimate. It has a (1) *liquid cylinder* of forged steel, (2) *stuffing boxes* of forged steel readily interchangeable to suit changing pressure or capacity conditions, (3) *plungers* of steel or ceramic, (4) *valves* of heat-treated stainless steel with high-strength springs and (5) *individual valve hole covers.* (6) *Cast iron frame* permits all torque to be applied near foundation. (7) *Crankshaft* is of one-piece forged steel, (8) *connecting rod* is marine type, forged steel with steel-backed, babbit-lined crank-pin bearings. (9) *Crosshead cradle liners* are of bronze, shim adjustable for easy alignment. (10) *Main bearings* are babbit lined with large bearing surface. Write for Bulletin W-415-B1.

For more data on the equipment described on this page write for bulletins mentioned in captions or for comprehensive bulletin on water-flooding, WP-1099-B-59, to Worthington Corporation, Section PC.3.6, Harrison, N. J.

WORTHINGTON

Roofs Protect Pumps From Weather



Make mud pump roofs from scraps of three-inch, two-inch and one-inch pipe and some used tank steel which will turn rains and provide a saving in fuel.

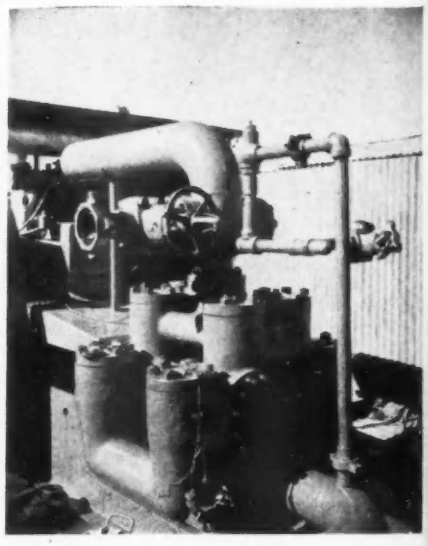
The three-inch pieces five feet long are welded to the base of the unit three feet in from each corner. Two-inch pieces are fitted inside the three-inch pieces to provide adjustment to the height of the roofs so that they can be lowered in the over-the-road position or to make room for long surge chambers.

The two-inch pieces are welded to a framework on which the tank steel roof rests. They are made by welding two-inch pipe in a rectangular frame the size of the base of the pump and then using one-inch pieces to make the crown of the roof.

The roof is formed by laying the tank steel over the ends of the one-inch uprights and welding the tank sections thereto.

These roofs are well within road widths and can be moved right along with the pumps without adding appreciably to their weight.

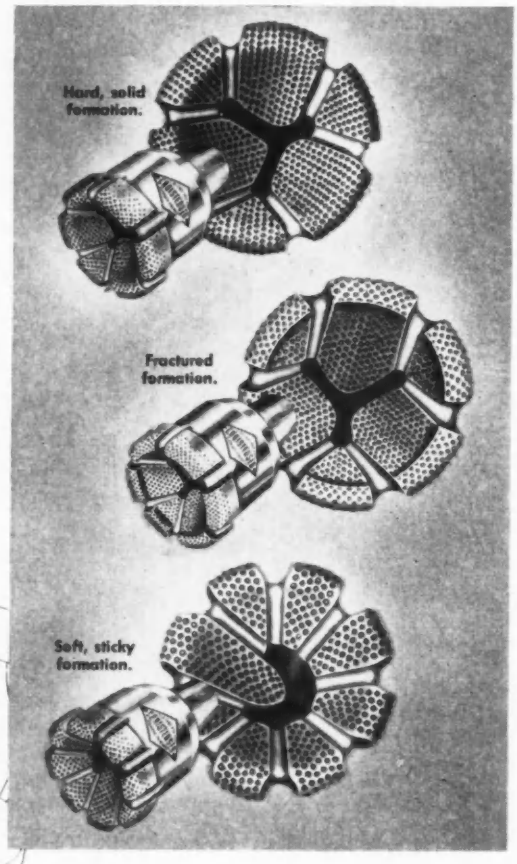
Note that when the studs of the steam cylinders become old, a plate is set up in front of the cylinders to prevent injury to workmen in case they are blown off.



Saving Waste Mud

When drilling is done at high pressures and the relief valve on the discharge line is apt to pop, a means must be taken to save the mud which gushes out. Make a simple permanent hookup by connecting the outlet of the pop valve back into the pump suction. Connections are made short so that the entire line may remain assembled and moved with the pump unit.

The connection for the relief line is made below the surge chamber with a nipple and tee installed running. On the side looking up, install the



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. . . for positive protection against joint leakage and creep!

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. . . for trouble free drilling because of the four points of seal!

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relief valve and make the connection to the suction of the pump using two hammer-type unions so that the line can be dismantled if necessary to facilitate moving. On the other opening of the tee, install the bleed line in case the pump is taken out of service or it is necessary to bleed the pump down for any reason. This line carries a valve and union so that it can be connected back to the pit or away from the pump.

Anchoring Pipe Tongs

Make a tong anchor of conventional pipe, secure it to the derrick floor and anchor swinging pipe tongs to avoid floor accidents.

One contractor has welded a triangular shaped frame of three lengths of pipe, welded to it a pipe base of desired length so it will stand upright, and has bolted the entire assembly to the floor with U-bolts. This prevents injury to personnel resulting from swinging tongs, and keeps tongs out of the way so that interference with subsequent floor operations will be avoided.

"FLOLIGHT" RIG LIGHTS

VAPOR PROOF DERRICK LIGHTING EQUIPMENT FABRICATED TO FIT ALL SIZES AND TYPES OF DERRICKS AND MASTS

"IT'S QUICK TO RIG UP"

HUTCHISON MANUFACTURING COMPANY

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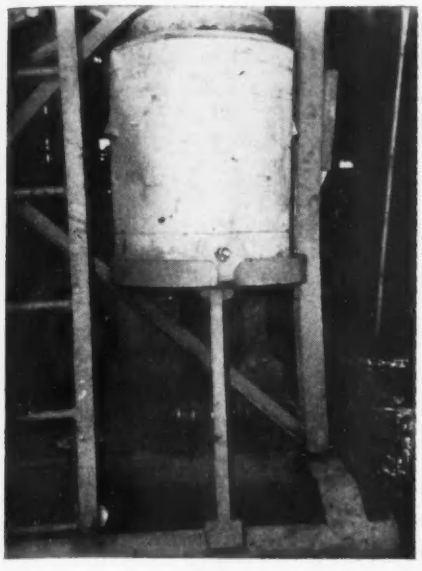
Baling Empty Bags

Use scrap pipe and make a combination storage bin and baler to take care of emptied bags which accumulate on barges or around rigs. Weld a cage frame of 1½-inch pipe as shown. Fix a spool of wire to the top right hand corner of the rack. The welding requires only a few hours.

Pile emptied mud, cement, and chemical bags and oil rags into the cage. When the cage is filled, wrap wire from the spool around the load. A neat, tight bale is the result.



Mounting Water Cooler

The drinking water container should be located in an accessible place around the rig but not so it will interfere with any operation.

Make the illustrated stand by welding a rim to a circular piece of sheet metal. A supporting leg is fastened to the bottom of the circular base. This unit can be installed at any convenient location on the rig.

Mounting Vise on Post

Mount a pipe vise on the snubbing post and speed up general connection work around the derrick floor. An easily accessible vise aids in performing maintenance tasks and can be used for other rig chores.

On Gulf Coast drilling barges where equipment can be standardized because rigging up or down is not a problem, this item is a convenient labor saver.

THE EASIEST WAY TO MAKE ENDS MEET

VICTAULIC FULL-FLOW TEES ELBOWS AND ALL TYPES OF FITTINGS ALL WIDELY ADAPTABLE AND EASY-TO-INSTALL ARE ONLY PART OF THE COMPLETE MODERN VICTAULIC 4-STAR METHOD OF PIPING. YOU ARE ASSURED FAST, STREAMLINED EFFICIENT CONSTRUCTION THAT SAVES $$$$ WITH VICTAULIC COUPLINGS FOR LOCK-TIGHT, LEAK-PROOF CONNECTIONS AT EVERY JOINT UNDER PRESSURE OR VACUUM; PLUS CONVENIENT PORTABLE VIC-GROOVER TOOLS FOR GROOVING STANDARD PIPE ENDS WITH SPEED AND EASE; AND QUICK, HANDY ROUST-A-BOUT COUPLINGS FOR PLAIN END PIPE AND ALL-'ROUND VERSATILITY. MAKE SURE YOUR NEXT JOB IS ALL VICTAULIC! PROMPT AVAILABILITY FROM LOCAL DISTRIBUTOR STOCKS COAST-TO-COAST.

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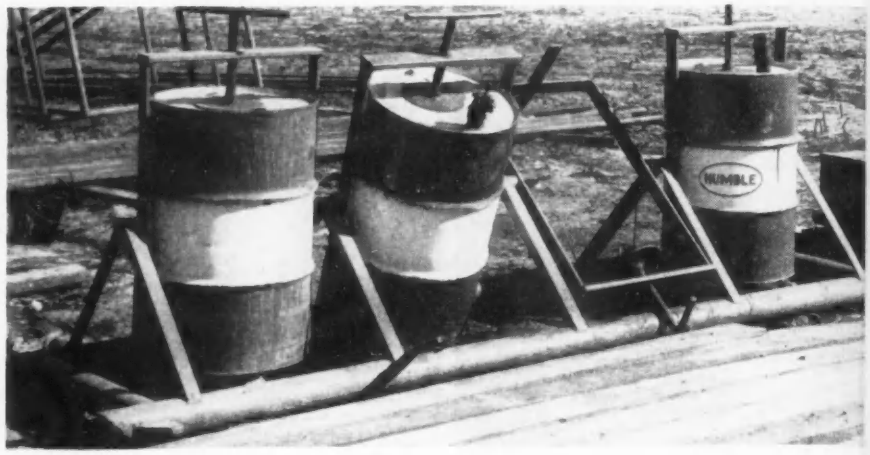
Racking Fuel Oil Drums

Steel disks on a jack screw mounted on a rigid frame can eliminate the hazard of handling oil and fuel on drilling rigs. At the same time, they minimize fuel losses and spillage frequently associated with most fuel racks.

Arrange the racks so that the fuel bibb is aloft while the fuel is not in use, making leakage impossible. The rack and frame shown here can be made from material found around any rig.



The steel one-inch stock strap and rectangular frame which encompass the drum are heavy enough to take the force of the jack screw. The jack screw itself is a large diameter stud bolt which is threaded through the steel bar at the top or through a companion nex nut welded to the underside of the bar.

The metal disk is made of light gage steel and is welded to the base of the jack screw. The pivots for the drums are made of 1½-inch steel rod welded to the vertex of the frame. They are slipped inside short two-inch nipples that are in turn welded to the angle iron supports. The foundation skid is made of four-inch pipe.

Rounding Tank Corners

Rounded corners in the mud tanks prevent mud from settling out at corners. The rounded corners are made from steel fillets with increasing radii which have been welded to cover up the seams in the tank. As the mud is agitated, it breaks against the side of the tank and maintains its homogeneity by the mixing and swirling action provided by the rounded section.

AN *Amelioration
IN LOST CIRCULATION PROBLEMS

SEAL OF APPROVAL 1953 For Advanced Achievement

*Amelioration, according to the dictionary is a "betterment and/or improvement". This definitely applies to Kingseal and Queenseal regarding lost circulation materials, as these products were deliberately designed to—CAULK—"To make tight by filling a crevice".

The strong resilient textile fibers of Kingseal and the flexible, impervious wood fibers of Queenseal, flex and pack into an interstice in the form of a tailored plug, permanently sealing and caulking.

NOW—The trailer as shown above is a mobile unit, containing equipment specifically designed to stop "Complete Mud Losses" in the cavernous or fissure areas. Manned by hydraulic and displacement experts, this unit introduces an entirely new method and technique, rapidly revolutionizing the lost circulation field and correcting this costly and exasperating problem.

The William E. Sievers Corporation and Sievers Company internationally specialize in "Lost Circulation". Their variations of applications, special injection equipment, complementary chemicals, mixtures and processes certainly have caused "An AMELIORATON" in the perplexing lost circulation problems. Their services are available at your inquiry.

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Foreign Distribution: J. E. HEROLD AND CO.
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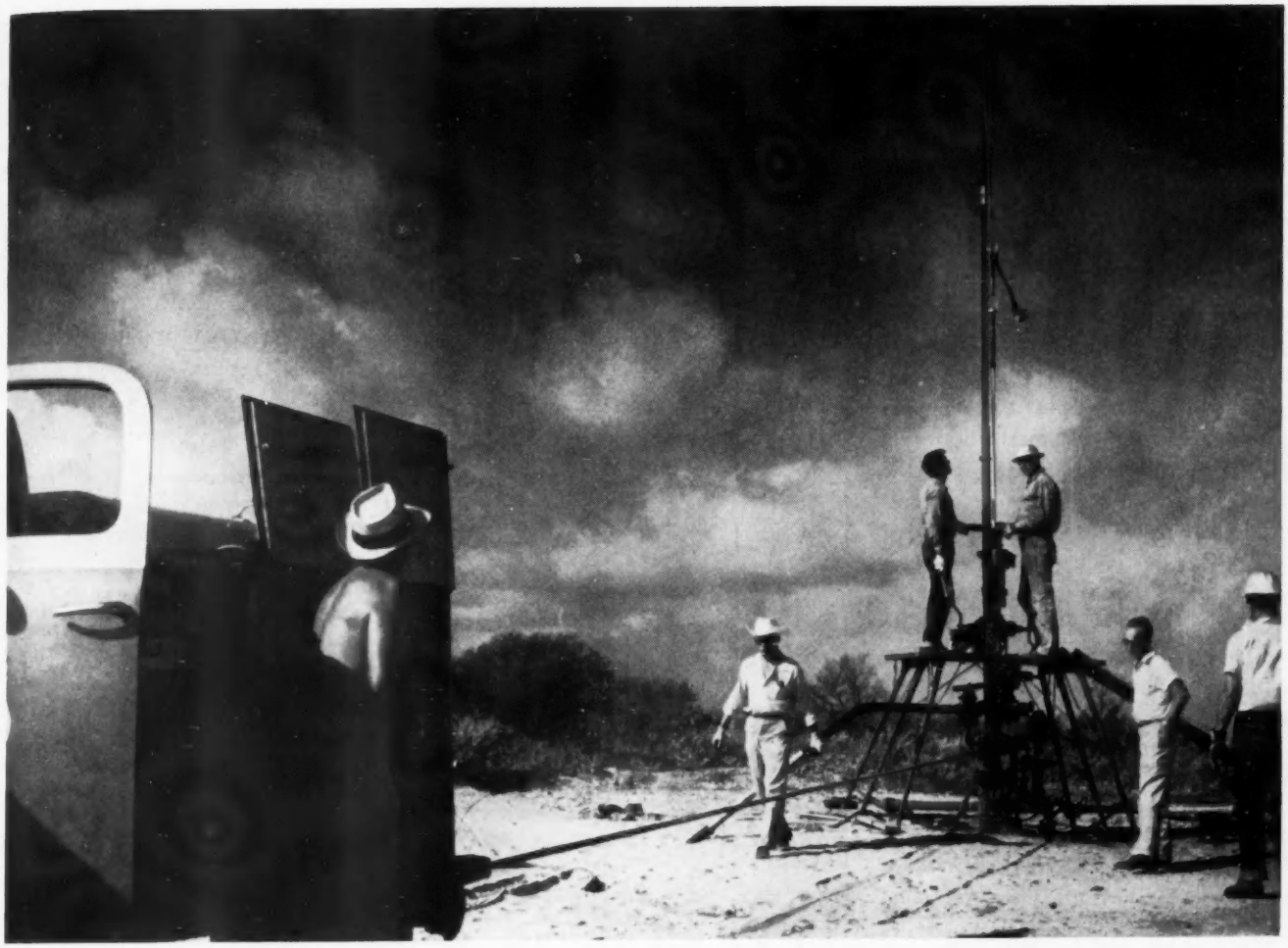
Kingseal and Queenseal are available *at your specification* from most mud service companies



THIS WELL IS BEING worked over, although there is little here to indicate it. Actually the crew is preparing the well for squeeze cementing.

Wire Line Methods Cut Workover Costs

Many thought it couldn't be done. But recent equipment developments make it practical to squeeze cement and reperforate wells without the use of a drilling rig. Expenses have been cut in half.

By J. E. KASTROP, WORLD OIL Staff

FEASIBILITY OF squeeze-cementing and reperforating a producing oil or gas well without the use of a drilling rig has been demonstrated on many recent workover jobs. Developments during the past two years in permanent-type completions[1] have brought about new equipment and techniques that are finding increased application in the field. Improvements in wire line methods for working over wells equipped with permanent-type completions have opened up an entire new concept of production practices that is making drastic cuts in completion and workover costs. Permanent-type completions have been made at savings up to 75 percent of conventional-type completions, and costs of workovers on such wells have

TYPICAL WELLHEAD assembly for a wire line workover.

been cut by as much as 50 percent.

The term "permanent-type completions" refers to wells in which the tubing and wellhead are installed only once in the life of the well. This installation is made while the drilling rig is on location. The rig is removed prior to perforating and bringing the well into production. In such completions, the tubing is left open-ended, a prerequisite for subsequent remedial work by wire line techniques. It is also essential that the bottom end of the tubing be located above any prospective zone that might be tested and produced in the future life of the well. In such permanent-type completions, the well is cased off, and if a production packer is used, it is desirable that the packer be of a type that does not require excessive tubing weights for setting. Since wire line tools must be run in and out of the well, the tubing must be full-opening and not constricted by kinks or sharp bends.

Value of Wire Line Methods. Cutting costs on any one workover job is, of course, important. The real value of wire line workover techniques lies in making it economical to test marginal zones that may not be profitable when high costs are involved. There are many fields which contain stringer sands of unknown potentialities that could easily be tested at minimum cost by employing wire line techniques. Valuable geological data are made available by testing relatively thin formations that may be commercial when a drill stem test was not conclusive. By such cost-cutting techniques, it is envisioned that additional valuable reserves will be made available. In contrast to production tests made with a drilling rig on the well and attendant high cost, the wire line workovers permit extended production tests without additional cost. In this manner, more accurate data can be obtained on the reservoir.

Gas-Lift Workovers. Wire line workovers have been made on many types of permanently-completed wells. But, perhaps the most interesting job is squeeze-cementing a perforated interval and reperforating a gas-lift well at a higher interval. Success of such a job is predicated on several features of this technique.

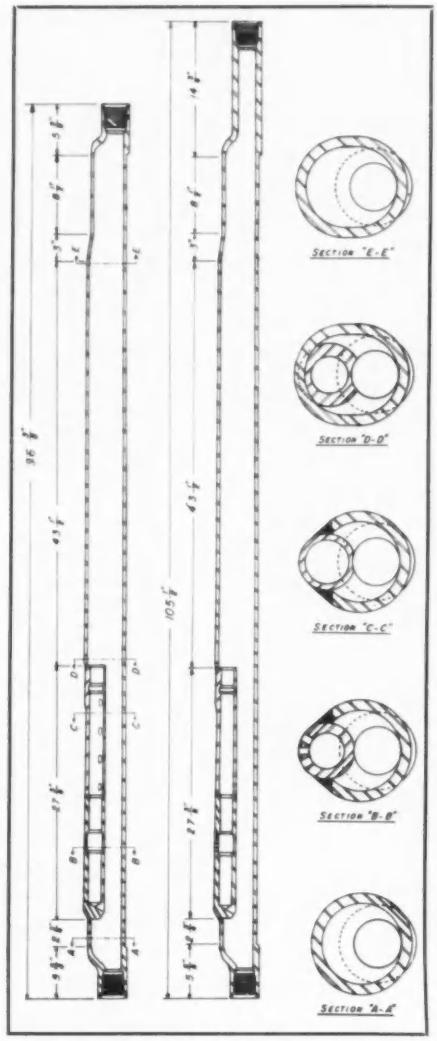


Fig. 1—Size and shape of retrievable gas lift valve mandrels used to permanently complete gas lift wells. Type at left is bottom mandrel. Others in string above it are of type shown at right.

- Tubing must be set above interval to be perforated.
- Tubing must be open-ended.
- Perforating gun must be small enough to pass through the inside of tubing, and yet be powerful enough to provide good penetration through casing, cement and into formation.
- Means of circulating fluid through the casing annulus must be provided.
- Excess cement down to top of plug must be removed without disturbing tubing setting.
- Well must be killed with salt water or other suitable fluids that minimize formation contamination.

Retrievable gas-lift valves have been developed that provide full tubing opening. These valves can be run in the well and seated in offset mandrels by wire line tools, and they can be replaced with dummies to blank off the opening through the mandrels into the casing. Outline of such a mandrel is shown in Figure 1. These offset mandrels contain several ½-inch ports that in normal operation permit gas to enter the gas-lift valves from the casing annulus.

Workover Procedure. At this stage of development, wire line workovers have been made only on wells that have a pressure gradient of less than 0.5 pounds per square inch per foot of depth. However, techniques and equipment are being devised to workover much higher pressure wells.

In working over a gas-lift well, the supply gas is shut off and a salt water fill line is hooked up. If salt water from the tank battery gun barrel is suitable, the flow line can be connected into the casing, and salt water pumped through the line from the battery by a small centrifugal pump. The well is filled with water. Since the

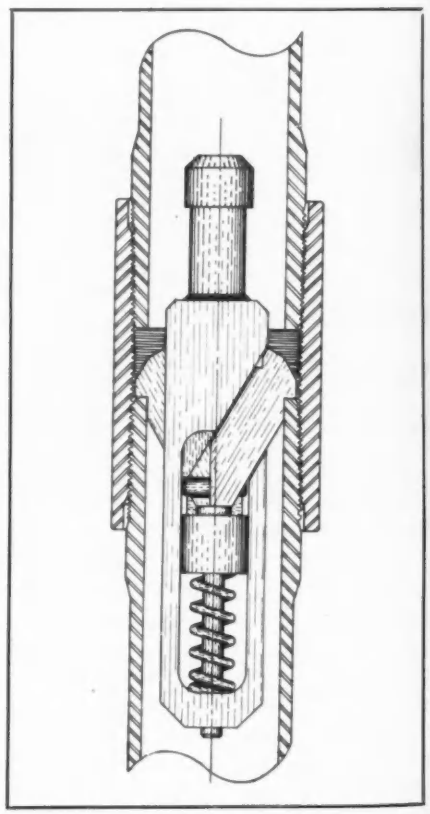


Fig. 2—Wire line retrievable tubing stop using collar lock mechanism.

Fig. 3—Wire line crew removes retrievable gas lift valve from pulling tool.

Fig. 4—Wire line kickover tool connected to dummy valve which blocks mandrel ports.

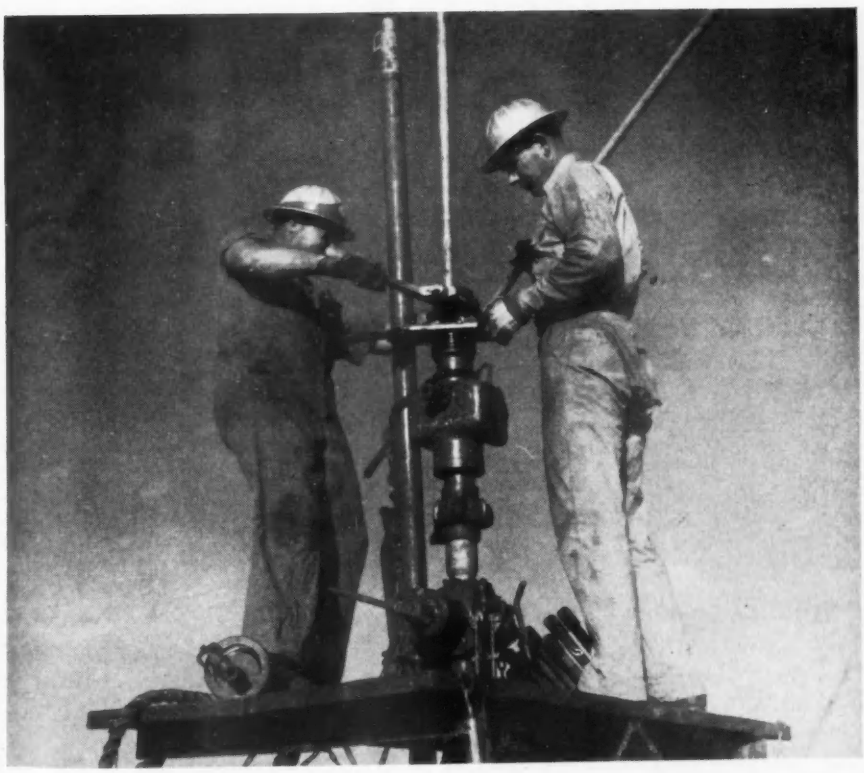
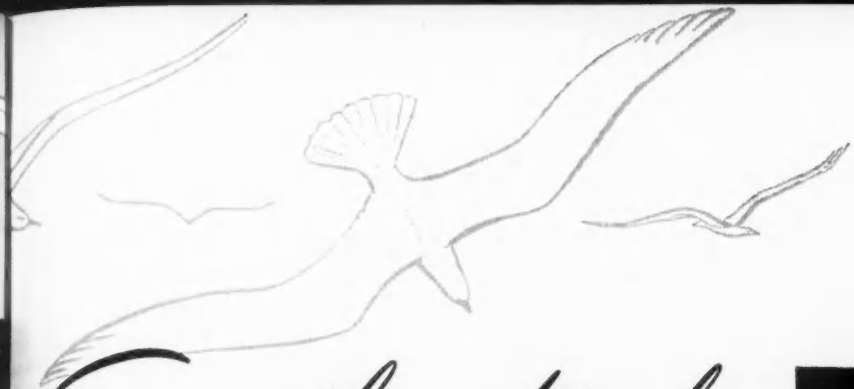


Fig. 5—First few joints of lightweight aluminum extension pipe are lowered in by hand.

Fig. 6—Lubricator being connected up prior to running extension pipe into well. Hanger assembly is attached to top of aluminum extension pipe.

Send for Bulletin 5305



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To accomplish a 25′ stroke, up and down, several times a minute results in dynamic loading of any pumping unit, regardless of type or make. It is not only important to minimize these loads, but also to damp them out promptly and obtain a smooth steady stroke during as much of the polished rod travel as possible.

The Axelson centrifugal pump which motivates our hydraulic system is specially designed and built to obtain the maximum of smooth action. This type pump (simulating the action of a fluid coupling) assures, to the greatest degree, a smooth steady stroke of the rod string, thereby eliminating much of the dynamic loading, and extending sucker rod life.

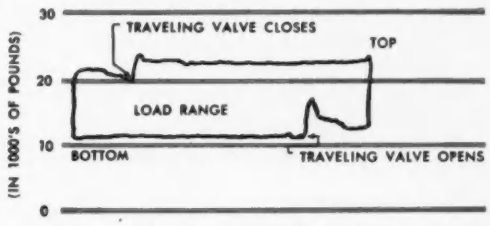
The Axelson Hydraulic Long Stroke Pumping Unit has 30,000* lb. load capacity and up to 350′ polished rod velocity.

Available in:

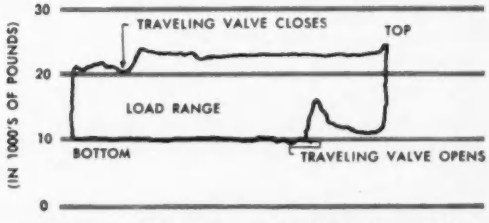
Model H-0312 — STANDARD DUTY — for well applications requiring 69 or less Engine Brake Horse Power.

Model H-0313 — HEAVY DUTY — for well applications requiring 70 or more Engine Brake Horse Power.

** Operation of Unit limited to either 30,000 lbs. polished rod load capacity or 14,000 load range.*



Card Area . . . 2.97 sq. in. • Stroke Length . . . 300 in.
Cycles per minute . . . 3.91 • Well Depth . . . 6,600 ft.
Pump Bore . . . 2 in. • Polished Rod HP . . . . 32.05 HP
Engine HP . . . 56.0 HP • Unit Efficiency . . . 57.4 per cent



Card Area . . . 3.52 sq. in. • Stroke Length . . . 314 in.
Cycles per minute . . . 4.9 • Well depth . . . 6,600 ft.
Pump Bore . . . 2 in. • Polished Rod HP . . . 48.0 HP
Engine HP . . . 88.5 HP • Unit Efficiency . . 54.1 per cent

Two typical dynagraph cards taken with an Axelson 25′ stroke unit on a 6,600 ft. well producing about 500 bbl. per day with a two inch bore pump. The rectangular-shaped card, with a comparative small deviation from the steady upstroke and downstroke horizontal line, helps to explain the exceptional sucker rod service obtainable. Although an actual picture of pressure changes in the cylinder below the piston, these cards give a very close indication of polished rod loads in the cycle.

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REPRESENTATIVES IN ALL PRINCIPAL OIL FIELDS

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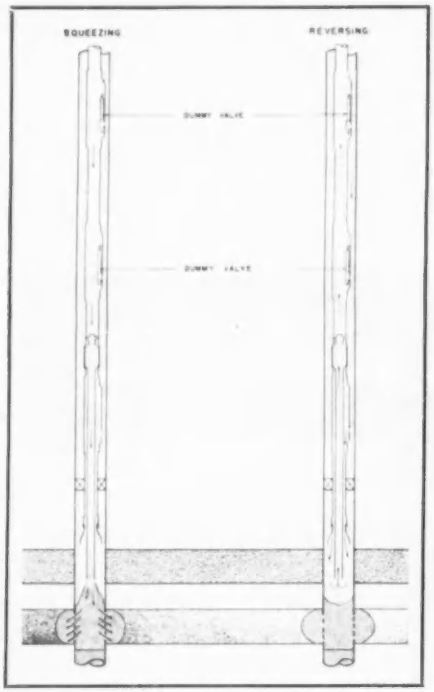

Fig. 7—Gas lift well hook up for squeeze cementing at left. Use of extension pipe in washing out excess cement is shown at right where circulation is reversed.

Fig. 8—Well at left being squeeze cemented without drilling rig present. Conventional squeeze procedures are followed.

gas-lift valves automatically open under water, the tubing is also filled. In this manner, the well is killed and placed under control.

A 10,000-pound test pressure blowout preventer for one-inch pipe is installed just above the master valve on the christmas tree to handle an extension pipe used to wash out excess cement. A wire line valve is connected above the one-inch blowout preventer, and a standard-type wire line lubricator is added at the top. A gin pole of suitable height is clamped to the christmas tree so that the long lubricator may be disconnected and supported above the wellhead.

A tubing gauge (2⅜-inch for 2½-inch tubing, and 1⅞-inch for 2-inch tubing) is run in the tubing on wire line to insure full-size opening throughout the string. In order to check the bottom of the hole and the bottom of the tubing, a bow-spring tool is run in on wire line. Weights carry the tool to bottom, but the bow spring supports part of the weight. Bottom of the well is checked, and by the change in wire line tension, the operator determines where the bottom of the open-ended tubing is located with reference to bottom of hole so that actual bottom-hole depth can be calculated. This operation is a check for any possible hole fillup.

To prevent the loss of any tools or equipment run in and out of the well during the workover pob, a tubing stop is hung in the collar between two joints of tubing located below the bottom gas-lift mandrel. A recent tubing stop design is shown in Figure 2.

All retrievable gas-lift valves are then pulled and dummies run back in the mandrels. Figure 3 shows wire line crew removing gas-lift valve from pulling tool. The bottom mandrel is left open so that fluid can be circulated through the tubing and up the casing annulus once the one-inch extension pipe is in place. Figure 4 shows a dummy valve hooked to a kickover tool which is attached to the wire line. This kickover tool is used to kick the dummy valves off center so that they can be inserted into valve seats in the offsets, thereby blocking the gas ports in the mandrel. The tubing stop is then pulled to make a clear opening through the tubing.

Tubing Extension. To be able to wash out excess cement from the squeeze operation, it is necessary to extend the tubing to within a foot above the top of the proposed cement plug. This is accomplished by using a small diameter extension pipe. Since the bottom gas-lift valve mandrel ports are open, there is communication of fluid between the casing annulus and inside the tubing, so that fluid can be pumped in either direction.

If fill-up in the cased hole prohibits the squeezing of a cement plug, the extension pipe is first run with telescoping joints, and the fill-up is washed from the well by reverse-circulation.

The extension forms a seal with the tubing when the extension hanger seats in a landing nipple located above the bottom gas-lift valve of the tubing string. Aluminum one-inch pipe with steel collars is used to minimize the weight that must be carried by the wire line.

To run this one-inch pipe in the well, the lubricator is broken off and laid down with the aid of the gin pole. The wire line valve and one-inch blowout preventer are opened full since the well has been killed with salt water and there is no danger of a blowout. Once the one-inch extension tube has been started in the well, the one-inch blowout preventer could be closed to halt any potential blowout. The first few joints are run in by hand and a notched steel plate serves as slips to prevent the pipe from falling into the well as shown in Figure 5. Strap wrenches are used to make this pipe up to minimize tong cuts in the relatively soft aluminum.

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Fig. 9—Tubing gun assemby used in wire line workovers. Only the cable head and magnetic collar locator are removed from the well after perforating. The gun itself is expendable.

Fig. 10—Cable head and collar locator of tubing gun assembly are removed from the well after perforating. Remainder of gun disintegrates upon discharge.

foot joints and is handled by means of a cathead attached to the wire line truck. A manila line is threaded through a block anchored to the wellhead, then up to the top of the gin pole and down to a swivel lift plug. The lift plug is screwed into the steel collar of each new joint added. As this new joint is tightened, the cathead takes the load, and the notched plate is removed so the string can be lowered into the well.

Length of extension pipe used will depend upon the distance from the top of the new cement plug to the landing nipple in the tubing string. As much as 1000 feet of extension pipe can be run safely in the hole in this manner. Top of the extension pipe is connected to the hanger assembly which packs off inside the landing nipple. After the last joint of extension pipe has been run in the well, the one-inch blowout preventer rams are closed tightly to support the entire string of aluminum pipe. The notched plate is removed, the wire line lubricator picked up and the running tools are attached to the extension pipe hanger, shown in Figure 6. The lubricator is screwed back in place and the extension pipe is ready to be lowered into the well.

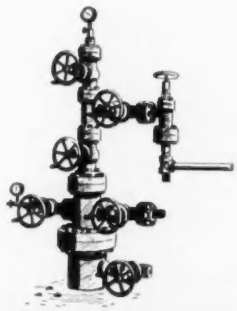
Circulating Pipe in Place. By the time the extension pipe has been made up and supported in the one-inch blowout preventer rams, cementing equipment has been hooked up to the wellhead. A large steel tank has been filled with salt water from the gun barrel at the tank battery. Circulation of salt water is reversed so that it flows down the casing and through the mandrel ports and up the tubing.

At this point, the blowout preventer rams are loosened and the wire line takes the full load of the aluminum extension pipe. Clearance of the pipe inside the tubing is small, and by reversing the circulation, much of the pipe load is taken off the wire line. After the extension pipe begins to descend in the tubing, reverse-circulation is stopped. Small clearance between hanger and inside of tubing restricts fluid passage to throttle the rate of fall.

The extension pipe hanger is equipped with a removable prong that closes the opening through the hanger. With the extension pipe hanger landed and while the wire line is still attached to the hanger prong, the pump on the cement truck pressurizes the tubing string to test for leaks. After the test indicates no leakage, the hanger prong is pulled from the well with the wire line. The lubricator is disconnected, a cap screwed in its place and the well is ready for squeeze-cementing.

Cementing Procedures. With the extension pipe in place, circulation is checked prior to mixing cement. From this point, normal squeeze procedures are followed. Some fresh water is pumped ahead of the cement, the desired number of sacks of cement are mixed to the prescribed slurry, and this is followed by some fresh water and then displaced with salt water until the cement is spotted at the bottom of the hole for squeezing. The casing valve is closed and the cement pumped in until the final squeeze pressure is reached. Surface connections to the pump are changed so salt water can be pumped down the casing annulus, and excess cement reversed out the tubing. Cementing operations are illustrated in Figures 7 and 8. Bradenhead squeeze pressures have been used to date, and experience has shown that less cement is needed with wire line squeeze-cementing than used in conventional squeezing.

Preparing Well for Perforating. When excess cement has been reversed out and clear salt water returns through the tubing, pumps are



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stopped and the lubricator picked up. A pulling tool is attached to the wire line, and the lubricator screwed in place, and the tool lowered to bottom. When the hanger has been jarred loose, the cementing pump reverses circulation to pump out the extension pipe, thereby relieving the wire line of the full load.

When the extension pipe reaches the surface the pump is shut down, the one-inch blowout preventer rams closed on the aluminum pipe, and the lubricator unscrewed. The extension pipe is removed from the well by reversing the procedure used to make it up.

During the time required to allow cement to set, the tubing stop is run back in place at the lower end of the tubing, and the dummy valves pulled from the well. Gas-lift valves with correct differential settings are run back in place on the wire line, the tubing stop removed and the well is ready for perforating.

Tubing Perforator. Just prior to perforating the well, flow lines and gas supply lines are connected up in preparation for bringing the well into production. Gas-lift valves in the well are useful in lowering the hydrostatic head by gas-lifting out as much water as desired prior to perforating. The hole may remain full of salt water if preferred. If the well were full at the time of perforating, the gas-lift system can be used to remove the hydrostatic head in stages to determine if the well will come in of its own pressure. If it does not flow, then all the salt water can be removed with the gas-lift system and the well brought in by gas-lift.

Development of a perforating gun[2] small enough to pass through tubing, yet powerful enough to penetrate casing, cement and formation, was essential to the success of permanent-type completions. Shaped charges are placed inside an expendable aluminum alloy carriage so that perforations are directed upward at an angle of 45 degrees above horizontal. Sizes were made for both 2-inch and 2½-inch tubing. Length of gun may be varied from 1 foot to 40 feet, depending upon interval to be perforated. A tubing gun assembly is shown in Figure 9. There are five shaped charges per foot of gun, giving up to 200 shots in the 40-foot gun.

The tubing gun is run in the hole with a casing collar locator that makes a permanent record of the tubing and casing setting.

Since the only part of the assembly brought out of the hole is the collar locator and casing head, measuring over-all about four feet, only a short lubricator is required on the wellhead. (See Figure 10.) The lubricator consists of a short nipple, a wire line blowout preventer and a stuffing box.

The gun is lowered in the well and discharged opposite the desired interval to be perforated. Collar locator and cable head are pulled up into the lubricator and the master valve closed. The lubricator can then be disconnected from the tree. Figure 11 is a rear view of a perforating truck especially designed for tubing-gun perforating.

Flowing Wells. Wire line workovers on flowing wells are simpler and less expensive due to less wire line service. Procedures are somewhat similar, and involve eliminating those phases pertaining to pulling and running the gas-lift valves. If the flowing well contains a production packer, communication between tubing and casing annulus must be provided. For wells without packers, the operation is a simple one. In bringing in a flowing well, it may be necessary to use a swab unit to lower the hydrostatic head prior to perforation or to swab the well in. Another means of lowering the hydrostatic head is by displacing some of the salt water in the tubing with fresh water.

Development Continues. Permanent-type completions were pioneered by Humble Oil & Refining Company engineers some three years ago, and many difficult problems had to be solved. Some doubted the practicability of completing wells in such a manner, and questioned wire line workover techniques. A new approach as different as this included some so-called "bugs" that had to be worked out. Wells are continually being set up to take advantage of this method of wire line workover, and a number of successful wire line workovers have been made to date. As engineers and service crews are trained in these techniques, wire line workovers will becomes an everyday occurrence. These techniques do not apply to any special region, but can be adapted to meet the problems in many oil fields. The method is rapidly progressing and equipment is being developed to work over high-pressure wells.

—The End

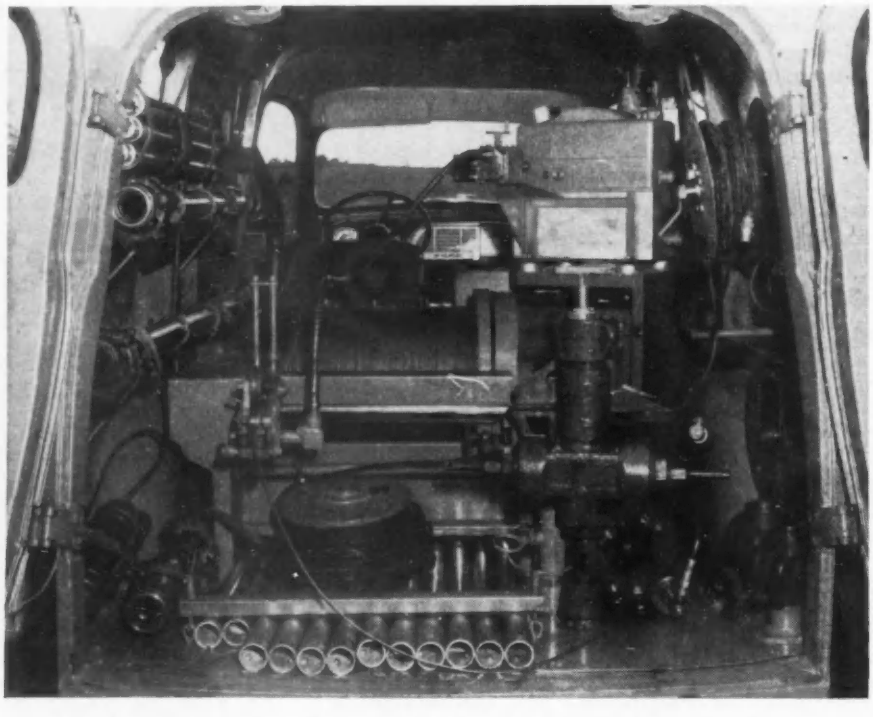

Fig. 11—Rear view of truck specially designed for the tubing gun perforator.

ACKNOWLEDGMENT

The author wishes to express appreciation to Humble Oil & Refining Company for permission to obtain data and photographs used in this article, and particularly thanks Gilbert H. Tausch of Humble's Production Department for help in organizing this discussion.

REFERENCES

[1] "Permanent-Type Well Completion" by T. A. Huber and G. H. Tausch, *Journal of Petroleum Technology*, Vol. V, No. 1, January, 1953.

[2] "A Method of Perforating Casing Below Tubing" by M. P. LeBourge and G. R. Hodgson, *Journal of Petroleum Technology*, Vol. IV, No. 12, December, 1952.

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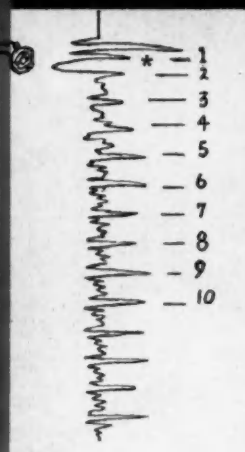
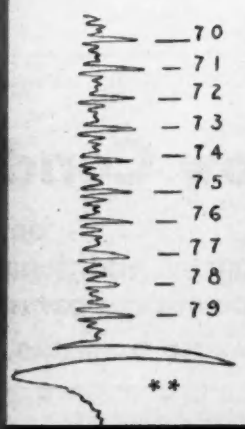


*Note clear indication of first collar

**Note clear indication of fluid level



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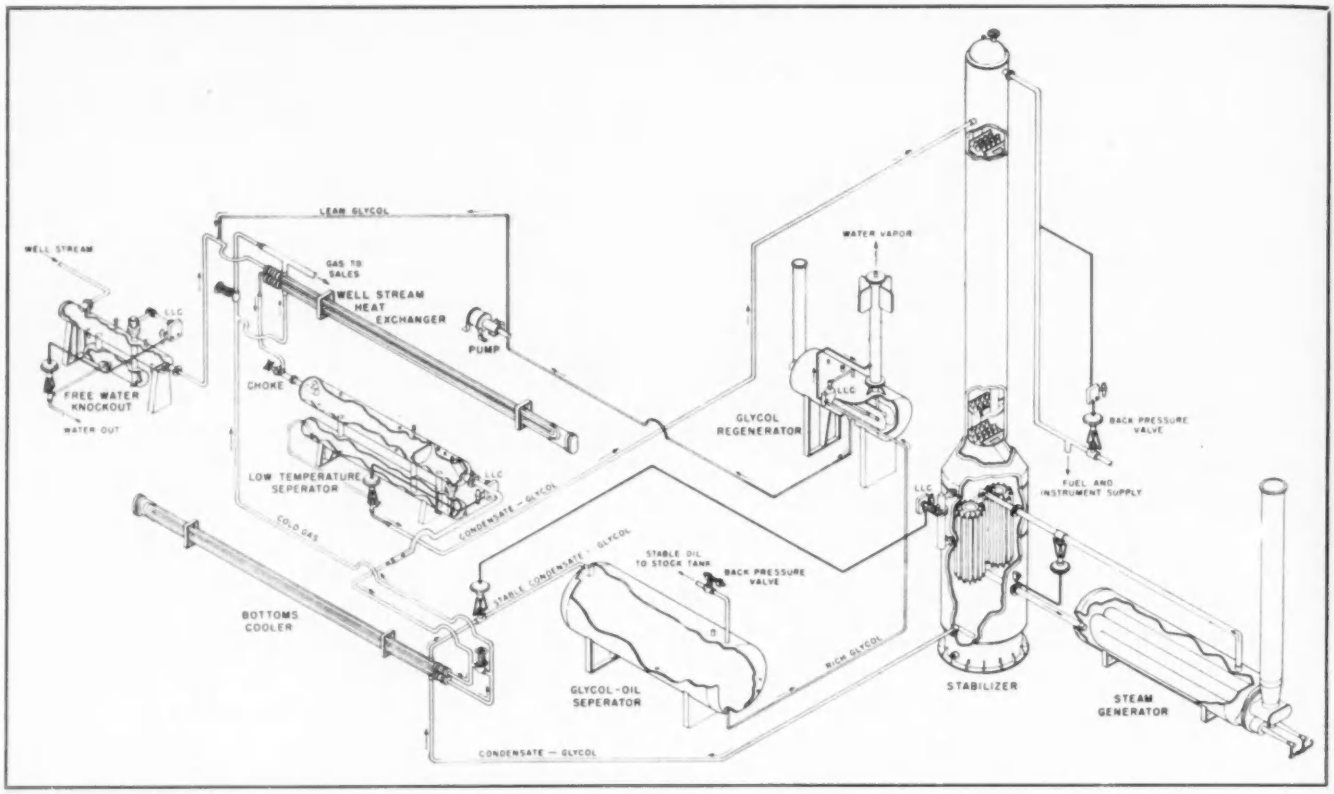


Fig. 1—Well hookup incorporating glycol injection system and stabilizer with low-temperature separation equipment on S. J. Felsenthal McGrede No. 1 Lease near Longview, Texas.

How Condensate Recovery Increased

. . . on an East Texas lease the yield was upped 22.4 percent with rapid payout of additional equipment through glycol injection and stabilization with low-temperature separation.

By HAROLD O. EBELING, Black, Sivalls & Bryson, Inc., Oklahoma City

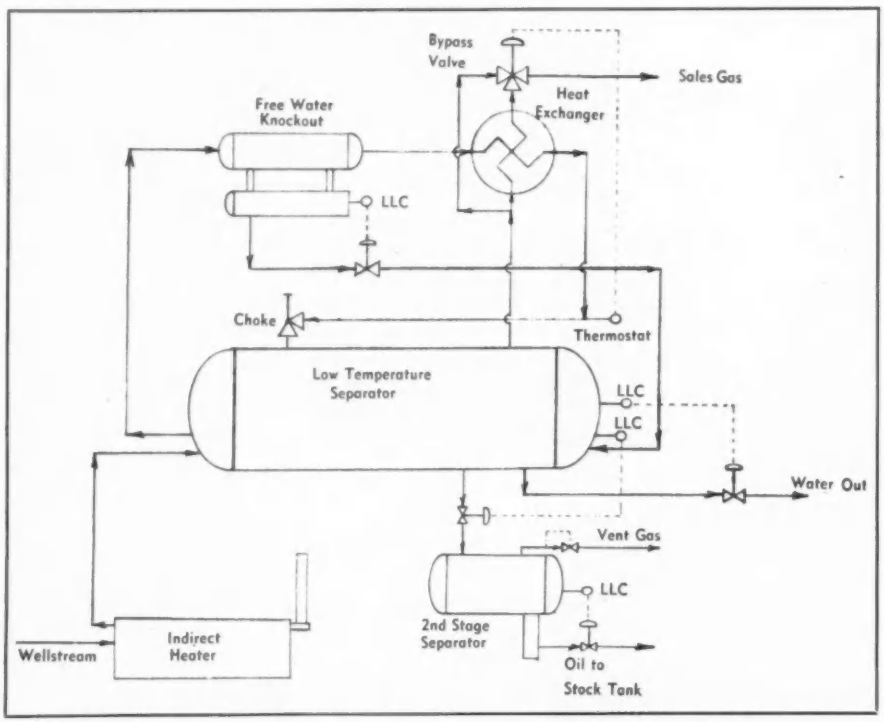
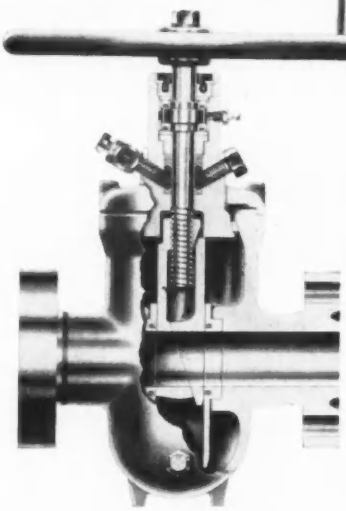


Fig. 2—Conventional mechanical low-temperature separation unit for the recovery of condensate from high-pressure wells.

AN INCREASE in condensate recovery of 22.4 percent from the same well was accomplished by use of low temperature separator with glycol injection and stabilizer in place of a conventional low temperature unit. Gross revenue from the S. J. Felsenthal McGrede No. 1 Lease in East Texas rose from $33,250 to $40,700 per year while flowing approximately 2 million cubic feet of gas per day through the separation equipment. This increase in condensate recovery was made at an additional investment cost of about $3500. The installation made on the Felsenthal McGrede lease includes equipment of recent development that has stepped up efficiencies in condensate recovery from high-pressure gas distillate wells.

Earlier Methods. An early successful method of producing a high-pressure gas-distillate well was by stage separation. This method used a heater prior to entering the choke or pressure re-



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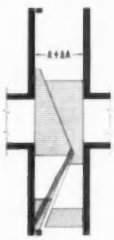
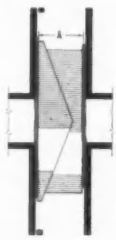


In closed position, the gate (left) and segment (right) seal tightly against both seats.



When opening or closing, the gate and segment are in neutral position permitting free upward or downward movement of the gate assembly.

When open, the gate and segment again seal tightly against both seats and the bore of each lines up perfectly with the bore of the body to provide a smooth, full-round conduit.

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ducing valve on the first-stage separator to prevent the formation of hydrates. Hydrates and resulting freezing were an evil to be avoided. However, while avoiding the hydrates by adding heat, some heavier hydrocarbons were stripped out of the distillate and lost with the sales gas. It would be impossible to determine the millions of barrels of distillate that have gone down the transmission lines with the sales gas.

In addition to these losses, there were losses from the vent lines of the intermediate separation stages. It was determined that the greater the number of intermediate stages the less loss of fluid, however economical limitations prevented the elimination of this source of waste.

The second method of producing high-pressure gas-distillate wells made such phenomenal increases in production that almost all operators are using low temperature separation units.

There are two types of low temperature separation units in operation today. The conventional unit and the glycol unit. The flow through both units is illustrated by flow diagrams in Figures 1 and 2. It is apparent the flow through both units is similar with one exception. The glycol unit has glycol injected into the wellstream to prevent formation of hydrates when cooling to as low a temperature as possible before entering the pressure-reducing valve. On the conventional unit the wellstream must not be cooled below the hydrate temperature.

The glycol injection unit requires the addition of glycol regeneration and injecting equipment. However, being able to operate the low temperature separator at the lowest optimum temperature (well below 0° F) will result in a maximum amount of distillate recovery.

Loss of stable distillate due to flashing in separator stages and weathering in the stock tank is well known. Low temperature separation, although increasing stock tank recovery of higher vapor pressure components will also increase flash losses. Fractionation or stabilization of high-pressure separator distillate will reduce greatly the flash losses. Therefore, stabilization becomes very important to fully utilize the benefits of low temperature separation.

The stabilization process consists of repeated contact, within a column, of descending distillate with ascending vapors. Ascending vapors are boiled off by adding heat in the reboiler section at the bottom of the column. Ascending vapors from the reboiler section are stripped of stable distillate fractions by the descending cool distillate. This process will greatly increase the recovery from both type units. The increase in production is proportional to the amount of fluid separated in the low temperature separator. Therefore, the glycol injection unit coupled with the stabilizer unit produces the greatest amount of stable distillate possible.

Field Test. To further prove the operational advantages of a low temperature separation unit with glycol injection and stabilization over that of a conventional low temperature unit, a test was made between the two units near Longview, Texas, on the S. J. Felsenthal, McGrede No. 1 lease. Equipment furnished for the test is shown on the flow diagrams of Figures 1 and 2.

General conditions governing the test were as follows:

1. Tank gauge volumes were corrected to 60° F.
2. Flow rates were calculated with the basic AGA flow equation on the base of 60° F and 14.65 pounds per square inch gauge.
3. The well was produced for 11 days prior to commencing the test to assure a stabilized flow rate.
4. A positive choke was used to eliminate possible surge of fluid.
5. Test period to be five days.
6. One gravity was run during the test for purpose of correcting the flow coefficient for each unit.

(See Table 1.)

Effect of stock tank weathering is apparent from the recoveries made during the middle three days of the test when a high vapor pressure product was being made. However, the average recovery during the entire test period was about 18.6 barrels of distillate per million cubic feet of sales gas. Had the stabilizer been set to make a 15- to 17-pound Reid vapor pressure product throughout the test, the recovery would have been about 18.8 barrels per million cubic feet of gas.

(See Table 2.)

Recovery by the conventional unit was favored by the low delivery pressures of the last three days of the test. Therefore, the average recovery should be tempered by the fact that had the delivery pressure been about 600 to 620 psig the average recovery would have been much lower. (See results in Table 3.)

The glycol injection low temperature separation unit with stabilizer produced 3.4 barrels per million cubic feet more than the conventional mechanical low temperature unit or an increase of 22.4 percent. Further, the glycol injection unit shows a 47.6 percent increase over the reported 12.6 barrels per million cubic feet recovery by stage separation.

From the test data, it is apparent that had the sales gas pressure not varied during the test, the conventional unit would not have maintained an average rate of 15.2 barrels per million cubic feet. Recovery would have been more in the neighborhood of 14.7 barrels per million cubic feet of gas. This would greatly change the picture with a 26.5 percent increase being made by the glycol injection stabilization low temperature unit.

There can be no question that the glycol injection stabilization unit will present the operator with the greatest

Continued on Page 184

TABLE 1
Glycol Injection Test Results

Flow Press.	Avg. Sales Press.	Temp. Out of Heat Exchanger	Avg. Sepr. Temp.	Flow Rate MMS-CFD	Total Bbls.	RVP	Bbls/ MMS-CF
2300	576	60 °F.	—16	2.310	46	19	20.0
2300	639	69 °F.	—15	2.397	43.5	23	18.2
2300	619	60 °F.	—17	2.410	44.7	23	18.6
2300	602	60 °F.	—18	2.474	44.7	20	18.1
2300	613	58 °F.	—22	2.474	46.9	17	18.9

TABLE 2
Conventional Low Temperature Separation Test Results

Flow. Press.	Avg. Sales Press.	Temp. Out of Heat Exchanger	Avg. Sepr. Temp.	Flow Rate MMS-CFD	Total Bbls.	Bbls/ MMS-CF
2300	618	76 °F.	8	1.864	28.2	15.1
2300	684	76 °F.	10	1.856	26.7	14.4
2300	551	76 °F.	5	1.845	28.0	15.2
2300	569	76 °F.	0	1.847	29.0	15.7
2300	536	76 °F.	5	1.838	28.5	15.5

TABLE 3
Results

	Glycol-Injection Unit	Conventional Unit
Total Flow MMSCF	12.135	9.247
Total recovery—bbls.	225.8	140.4
Bbls/MMSCF increase	3.4	0
Percent increase	22.4	0

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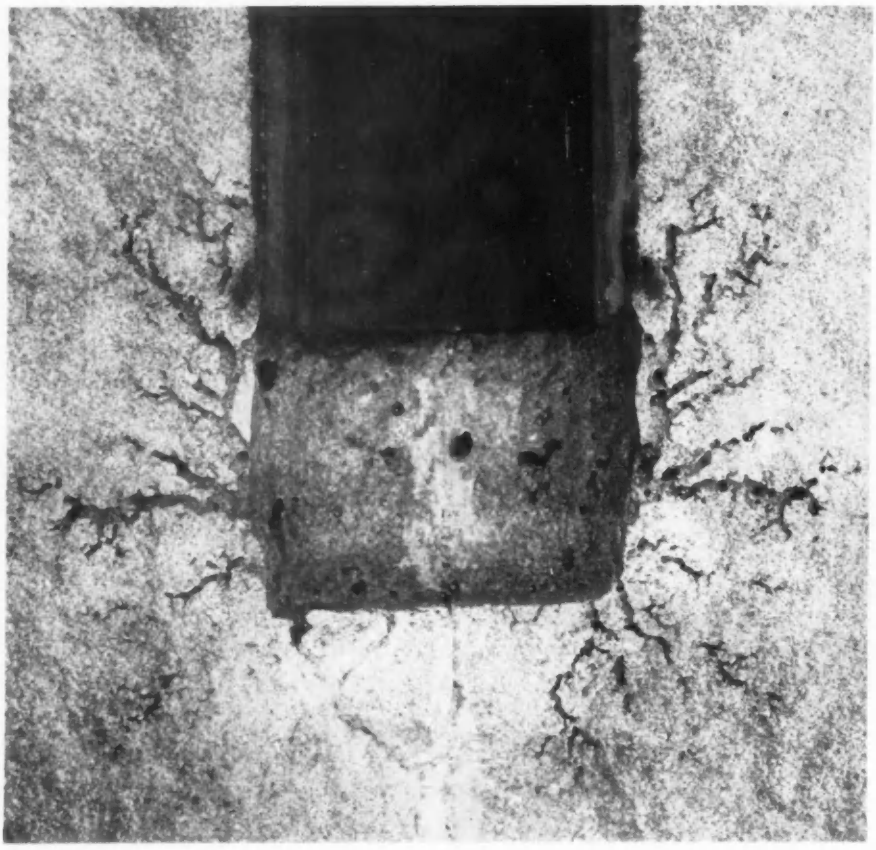


Fig. 1—Cross-section of formation sample showing channels formed in formation by channeling acid.

Compressed Gas Cuts Carthage Acidizing Costs

As much as $1100 was saved on one job. Risk of formation contamination eliminated. And with no hydrostatic head, swabbing was unnecessary.

By P. S. CLINKENBEARD
Dowell Incorporated, Shreveport, La.

COSTS OF FLUSHING liquids and subsequent swabbing expenses have been eliminated in acidizing gas wells by employing compressed gas as the flushing medium. Savings have ranged from $800 to $1100 per job. Several marginal wells in the prolific Carthage field of Panola County of East Texas, when treated in this manner using a channeling-type acid resulted in potential increases of several fold. Compressed gas was used to force the final acid treatment into the formation under controlled conditions so that no hydrostatic head resulted, enabling the wells to clean themselves out quickly. Danger of contamination of the formation by using water as a flushing fluid was eliminated. Where other fluids were used, such as kerosine, cost of these flushing fluids was eliminated. Without a hydrostatic head on the formation, it was not necessary to swab the well in. Savings in using compressed gas are due primarily to the elimination of swabbing charges and cost of kerosine as a flushing medium.

Channel Acid Used. Acidizing method used in the Carthage field employed a channeling-type acid which was first introduced to the industry in 1951. Composed of hydrochloric acid and various chemical additive agents, this type acid is not confined to the immediate vicinity of the well bore. It forms long, narrow channels of ⅛ to ¼-inch in diameter that extend a considerable distance into the formation. Action of this type acid on a lime sample is shown in Figure 1.

At first, the solution is quite viscous, and when injected into the formation it tends to selectively enter only the largest exposed pores at the formation face, bypassing the smaller pores. It has the ability to form a film on the inner surface of the pores as they are enlarged so that the film actually restricts further enlargement. Consequently, the acid produces a lengthening of the pore channels rather than broadening them.

Since the action of the acid is restricted, it does not spend itself rapidly over the enlarged channel bore area. The acid does not remain thick and viscous, but breaks down shortly after it has been injected into the formation. The length of breakdown time is determined by the bottom-hole temperature.

Once the initial small channel has been formed, a second stage of conventional acid is forced into the formation. This acid, following the path of least resistance, enters the channels, quickly stripping the residual film from the pore walls, and enlarging the diameter of the newly-formed channel. Result of this controlled acid action is a number of new pathways leading into the well bore through which oil and/or gas may be produced.

The Carthage Field. Until recently, the prolific Carthage gas field of central Panola County has not re-

quired any form of reacidization program because of the high bottom-hole pressures and high production. There are three important producing formations: the Hill, the upper Pettit and the lower Pettit. Total estimated gas reserves of this field are, according to the U. S. Bureau of Mines, about 7.604 trillion cubic feet. This does not take into account the estimated recoverable condensate from this volume of gas.

These formations are highly soluble in regular acid and were treated upon completion with volumes ranging from 1000 gallons to 10,000 gallons, depending on the location of the well in the field. The average volume used was 5000 gallons. The initial results of acid treatments were very good in that the initial open flow rates would increase between 200 and 500 percent.

Bottom-hole pressures in 1946 ranged from a minimum of 2636 pounds per square inch in the Hill to 3265 psi in the lower Pettit. However, the pressure range has declined to a minimum of 1269 psi and a maximum of 2700 psi. It is believed the minimum pressures occur in a localized area of tight permeability in which the gas is being depleted more rapidly than it is fed into the area of that particular well. There are several wells in various parts of the field in which the bottom-hole pressure has declined more rapidly than the field as a whole.

Producing Formations. The Hill section is a member of the Rodessa formation. It is a soft oolitic limestone varying up to nine feet in thickness. Porosity and permeability seem to be fairly continuous over the limited productive area. The Hill is only productive in a small section of the northeast corner, in the south central, and in the southeast corner of the field.

The upper Pettit consists of shale and oolitic limestone varying up to 32 feet in thickness. This section will vary in thickness and position across the field because of the shifting characteristics of the shale and dense lime sections. Production is usually confined to one zone of this section. The upper Pettit covers the entire field, but is not productive in a small section in the southeast corner of the field.

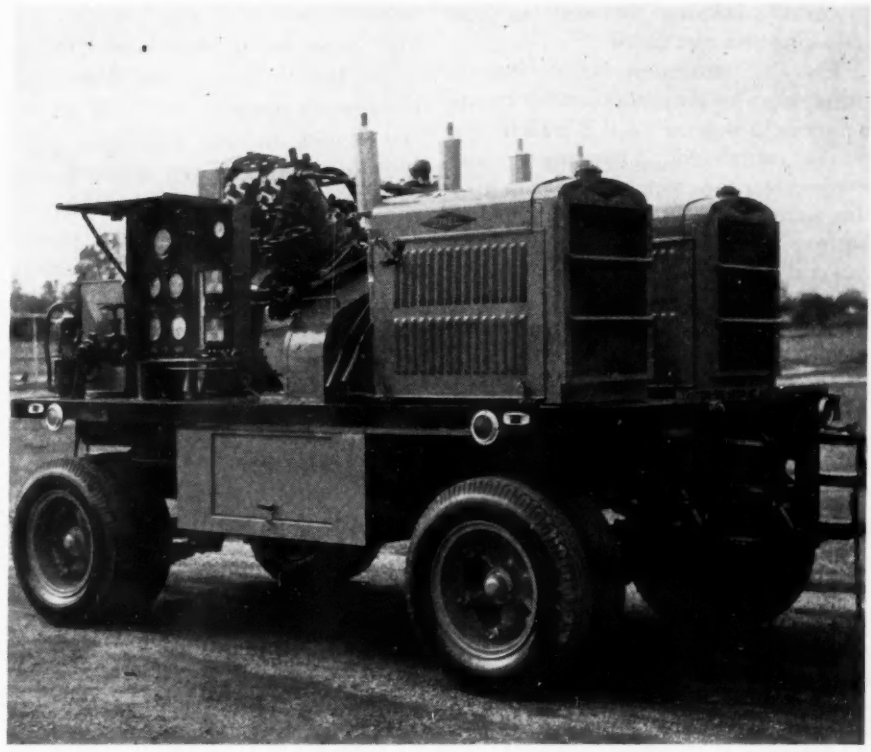


Fig. 2—Trailer-mounted gas compressors were used to pump down the final acid batch.

The lower Pettit is 150 feet below the base of the upper Pettit. It is a porous oolitic limestone lensing out in the updip along the flanks of the field. It is imbedded irregularly with shale and dense limestone causing many lenticular sections varying in thickness up to 41 feet. Water levels have been established in the southwest edge of the field, but the water table is very sporadic due to the very nature of the lower Pettit. This section is productive throughout the field.

About the Author

PAUL S. CLINKENBEARD is district engineer for Dowell Incorporated at Shreveport, La. He served in the U. S. Air Force from 1943 to 1946, when he entered Oklahoma A. & M. College at Stillwater, Okla. He received his B.S. degree in mechanical engineering in 1949 and joined Dowell Incorporated immediately thereafter as a junior service engineer at Kilgore, Texas. Subsequently he was promoted to service engineer and in January, 1951, was transferred to Bossier City, La. In September, 1951, he was promoted to district engineer, and stationed at the Dowell district office in Shreveport.

Field Results. Well A had been treated with 2000 gallons of conventional acid in 1946 and flowing pressure had dropped to the point where it would not produce into the gathering system without a compressor. The line pressures normally vary from 1100 to 1250 psi on this high-pressure system. This well was retreated with 750 gallons of channeling acid followed by 4500 gallons regular acid. Kerosine was used as a flushing medium in order to keep water off the formation. The well was completed by swabbing. Before the treatment, this well produced 1 million cubic feet of gas with the compressor and no gas without it. After the retreatment it produced 2 million cubic feet with the compressor and 1 million cubic feet without the compressor.

On the basis of the results from this first treatment, it was decided to use gas as a flushing medium in an effort

to avoid swabbing the well back in following the treatment.

The first treatment made using a compressor in conjunction with channeling acid was on Well B which was dually completed. Treatment was made down the casing in order to give the procedure a good test, as the bottom-hole pressure was only 1265 psi and the annular volume is more difficult to unload than the tubing. This well had been acidized with 4000 gallons of regular acid in 1946, with a breakdown pressure of 2800 psi and a final pressure of 800 psi at an injection rate of 2.5 barrels per minute. The bottom-hole temperature is 196° F.

This treatment was planned to use sufficient regular acid to displace all of the channeling acid and an equal volume of regular acid into the formation, before having to shut down to hook up the compressor. A total of 750 gallons channel acid and 4500 gallons regular acid was used. At this elevated bottom-hole temperature, the channeling acid would lose its viscosity before the compressor was hooked up. It was desirable to obtain maximum penetration with the acid before it did break down. Maximum pressure attained was 1200 psi, just when the regular acid reached the formation. The injection rate at this time was 1.7 barrels per minute. The final pumping pressure was 900 psi at 2 barrels per minute. The initial compressor pressure was 200 psi, gradually climbing to a maximum of 1490 psi. The casing was then opened and a half hour later, spent acid was flowing into the pit through a ½-inch choke. This well was producing 675,000 cubic feet before the retreatment, and produced 1,022,000 cubic feet following, with a gradual decline to its present 750,000 cubic feet per day.

Well C had been treated with 3000 gallons of regular acid upon completion in 1946. It had a string of 1¼-inch macaroni tubing in it and a bottom-hole pressure of 2361 psi. Sufficient regular acid was pumped down the 1¼-inch—2½-inch annulus to have a maximum pressure build up on the casing before starting the channeling acid. A maximum pressure of 3000 psi was obtained just as the regular acid started into the formation. 750 gallons of channeling acid were then injected into the formation followed by 4500 gallons of regular acid. The final pumping pressure was 2500 psi at 2.1 barrels per minute. The initial compressor pressure was 1900 psi and the maximum was 2150 psi. Spent acid was returned ten minutes after the annulus was opened. This well was making 2,500,000 cubic feet with a compressor before the treatment, 150,000 cubic feet without a compressor, and is now making 2,650,000 cubic feet without a compressor.

Well D had previously been acidized with 4000 gallons of regular acid upon completion in 1947. The breakdown pressure was 3200 psi, and the final treating pressure was 1650 psi. The bottom-hole pressure was 2050 psi. It was retreated with 1000 gallons channeling acid and 6000 gallons of regular acid. This well was treated down the tubing and a maximum pressure of 2000 psi was reached just as regular acid hit the formation. Minimum pumping pressure was 1750 psi at 3.5 barrels per minute. Three barrels of kerosine were pumped immediately behind the regular acid before hooking up the compressor in this well to prevent having to go to excess pressure on the compressor. The compressor started at 1350 psi and a maximum pressure of 1900 psi was reached. Spent acid was returning to the pit in 12 minutes after opening the tubing valve. This well was making 250,000 cubic feet before the retreatment and is now making 1,250,000 cubic feet. This well paid the total cost of the acid retreatment in ten days.

Use of compressed gas in conjunction with acidizing is a valuable gas well stimulation technique that should find increased application. The compressor was first used in the Monroe gas field in 1933 as a means of keeping undesirable fluids from contacting the formation. However, Monroe is a relatively low-pressure field, with bottom-hole pressures of 100 to 900 psi. Bottom-hole pressures at Carthage range from 1250 to 2700 psi. Each well should be investigated individually before making any decision for treatment. It is necessary to know the volume of acid used on completion, the breakdown pressure, the final treating pressure, the injection rate, and the bottom-hole pressure to properly plan a compressor treatment.—**The End.**

Condensate Recovery Increased

Continued from Page 179

amount of profit throughout the life of the production. Assuming a flow rate of 2 million cubic feet daily, this increase will produce a gross total of $7450 per year based on a price of $3 per barrel and a rapid payout of the increased cost.

In addition to the increased revenue the following conditions favor the installation of the glycol-injection stabilization unit:

1. The sales gas is dehydrated more efficiently due primarily to the glycol absorbing water vapor and a much lower separator temperature.
2. Throughout the life of the well, the production will be increased due to lower separator temperatures and stabilization.
3. If necessary to install a dehydrator to meet pipe line specification gas after well pressures have declined, this unit will require a minimum of additional expense. It will only require a glycol absorber inasmuch as the glycol regeneration equipment is already installed.
4. There is one less automatic control valve with the glycol injection unit, due to not requiring a temperature control valve on the wellstream heat exchanger to prevent formation of hydrates.
5. Possibility of freeze ups are reduced to a minimum due to glycol injection. Temperature out of the heat exchanger averaged 60° F, well below the hydrate point while the conventional unit was required to keep the temperature at 76° F.
6. Operationally, there is very little difference between the man hours required to operate either unit. It is necessary to add oil to the pump lubricator and periodically add glycol. Experience has shown that glycol losses do not exceed one gallon per 100 barrels of distillate, or when flowing 2 million cubic feet of gas per day this will be about $.73 per day.

This test proved that the low temperature separation unit with glycol injection and stabilization present the lease operator with the most economical means of producing this high pressure gas-distillate well.—**The End**

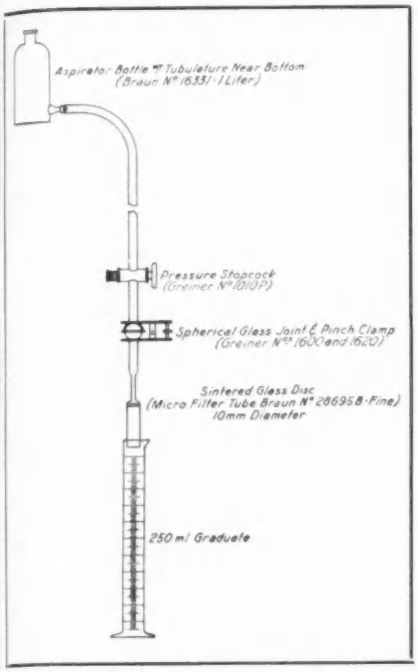

Aspirator Bottle w/ Tubulature Near Bottom
(Braun N° 16331 / 1 Liter)
Pressure Stopcock
(Greiner N°1010P)
Spherical Glass Joint & Pinch Clamp
(Greiner N°s 1600 and 1620)
Sintered Glass Disc
(Micro Filter Tube Braun N° 286958-Fine)
10mm Diameter
250 ml Graduate

FIGURE 1

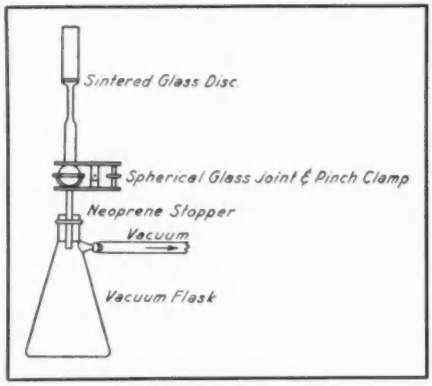


FIGURE 2

How to Test Quality Of Injection Water

Plugging characteristics can be determined long before an injection system is designed. Here's how it's done with a simple lab procedure.

By **WILLIAM F. CERINI,** Union Oil Company of California, Whittier, Calif.

AN EMPIRICAL TEST for determining the plugging characteristics of an oil well injection water consists of determining the changes in the filter rate of water at constant pressure when passing the water through a medium or fine grade sintered glass disc. This measures the degree of impairment to flow through a porous medium caused by the deposition of suspended matter on the surfaces and interstices of the medium. The degree of this tendency is assumed to be proportional to the slope of a rate-time curve versus cumulative throughput for the same filter.

A disc with similar characteristics must be used in successive tests so that relative comparisons can be made. The tendency of the impairment to flow is a function of the slope. Experience has shown that as the slope increases, the quality of the water decreases.

The apparatus, diagrammed in Figure 1, consists of a 1-liter aspirator bottle with a tubulature near bottom; approximately 15 feet of tubing; a two-way glass stopcock; a fine or medium grade sintered glass disc, commonly termed a microfilter tube; a 250 milliliter glass clyinder and a stop watch. The tubular end of the glass disc is fitted with the male section of a spherical glass joint which connects to the female section of the joint attached to the two-way glass stopcock. Auxiliary equipment required for cleaning the disc consists of a hot plate or other means of heating, a beaker, vacuum flask, an aspirator or vacuum pump, cleaning solution and distilled water.

The test may be made either under a positive pressure or a vacuum. Normally, the test is run by elevating the reservoir bottle to obtain a head of approximately 15 feet. This provides a constant pressure. An externally applied pressure, such as air or gas, may be used and the test performed at one level. However, the pressure must be maintained constant without fluctuations and control may be more difficult. A constant excess pressure relief may be of assistance in this case and can be provided by means of a fixed height mercury column bleeding excess air or gas in the line between the source of regulated pressure supply and the bottle. If a vacuum is used, the differential pressure across the disc is obtained by a vacuum pump with a constant pressure regulator provided in the line from the graduate to the pump.

Using a fine grade sintered glass disc with a permeability of approximately 100 milidarcys and an elevated bottle providing a constant head, the procedure adopted for the water quality test is as follows:

1. The tubing is attached to the bottle with the closed stop-cock fitted to the opposite end. Fill the bottle with the water to be tested.
2. Referring to Figure 1, elevate the bottle so that the water can be collected below at a convenient height. Flush out the line to remove all air to the outlet of the stop-cock.
3. Attach the filter disc by means of the spherical glass joint and clamp. Before completely attaching, open the stop-cock momentarily and fill the tube with water to the top of the disc. All of the air must be removed above the disc in order to insure single phase flow.
4. Place graduate under the filter disc.
5. Open stop-cock and start the test. At the same time, start the stop watch.
6. Record time to run 10, 30, 50, 70, 90, 110 and 130 ml. Stop determination after 130 ml has passed.
7. If the liquid permeability is de-

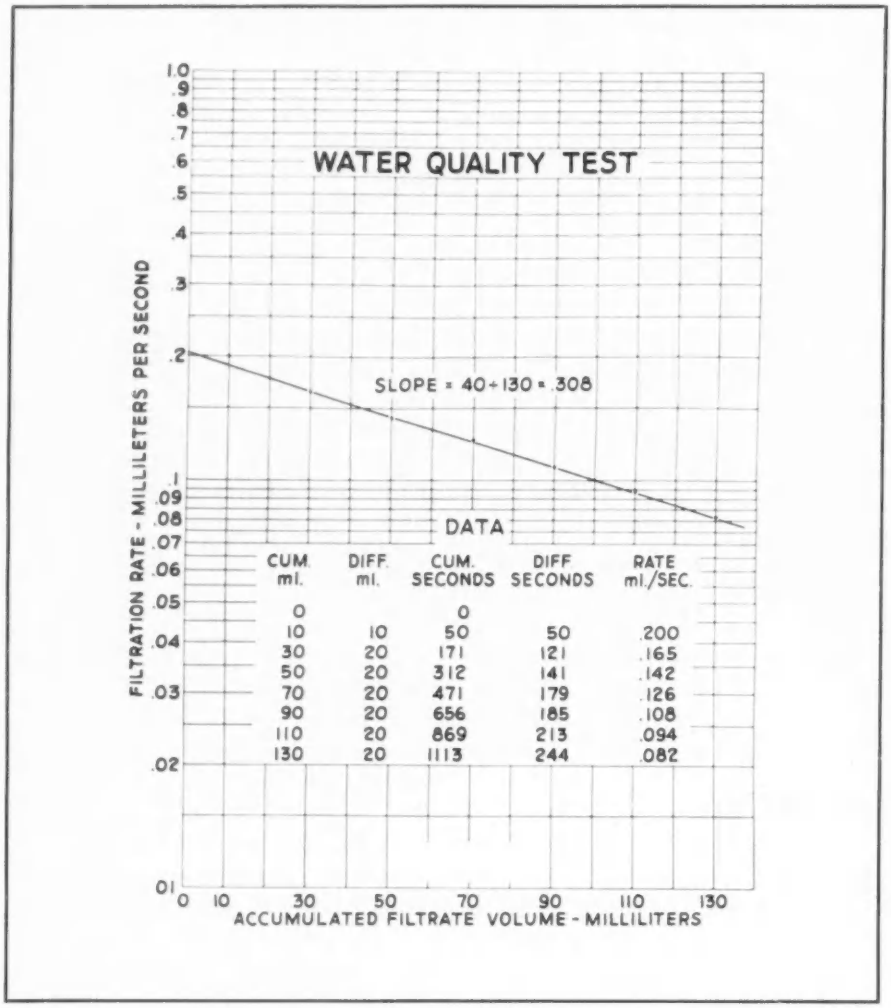


FIGURE 3

sired, note and record the temperature of the water in the graduate.

8. Plot results on semi-log, two cycle graph paper, plotting milliliters per second (ordinate) versus accumulated milliliters of water filtered (abscissa). A straight line is drawn through the locus of the points on the graph sheet. The slope is calculated by dividing the linear ordinate (vertical) units by the linear abscissa (horizontal) units on the same scale. This may be easily obtained by noting with a paper the height the ordinate decreases between 0 and 130 and laying this paper on the abscissa scale and measuring the distance between the marks. An example is illustrated in Figure 3.

When a 100 md disc is used, clean distilled water will have a slope of "0." A good quality water will have a slope from 0 to —.20. A fair quality water will have a slope from —.20 to —.50. A poor quality water will have a slope from —.50 to —.75. A water with a slope greater than —.75 normally would be expected to cause serious plugging on the sand face of an injection well.

It was previously mentioned that the liquid permeability of the disc may be determined. From the known salinity and temperature, the viscosity can be read from published charts. The area and length of the disc can be determined and the permeability computed from the formula:

$$k = v\frac{1}{A} \times \frac{Q}{dP}$$

where v = viscosity of the water in centipoises
1 = length of the disc in centimeters
A = area of the disc in square centimeters
Q = rate in milliliters per second
dP = pressure differential across face of disc in atmospheres.

The disc should be cleaned after each run. Hot chromate sulfuric acid solution was formerly used, however, hot aqua regia in a 1-1 ratio, followed by hot sulfuric acid of the same strength ratio has been found to be more satisfactory. Extreme care should always be taken to avoid spilling the cleaning solution on the skin or clothing. The disc is first attached by its ball joint to the vacuum flask, as illustrated in Figure 2.

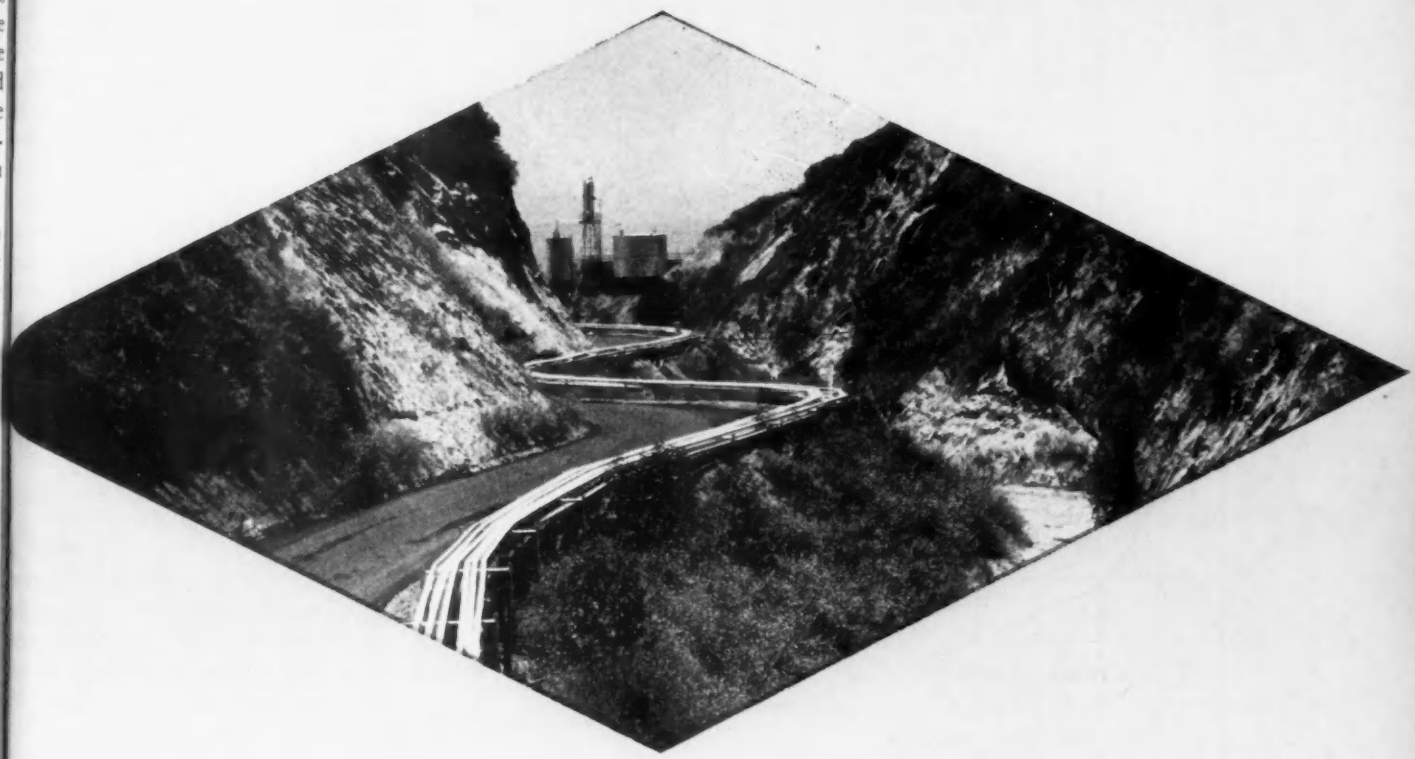
The cleaning solution is then poured through the disc, at the same time maintaining a vacuum on the bottom side of the disc to hasten the flow. After several rinsings with the cleaning solution, the disc is finally cleaned with distilled water. When a vacuum is not available, it has been usually found that the disc may be cleaned by pouring a small amount of the cleaning solution on top of the disc and placing it in a beaker, the bottom of which is covered with the cleaning solution. The cleaning solution in the beaker is then boiled which in turn causes the solution to boil above the disc and also forces the solution up the tube below and through the disc. After approximately 10 minutes, the cleaning solution is replaced with distilled water and the procedure repeated. Finally, the disc is rinsed with cold distilled water.

There may be occasions when the cleaning solution will not clean the disc, for instance, if free sulfur is deposited. This may necessitate the use of carbon disulfide as a preliminary. Concentrated sodium hydroxide has been found to be effective, however, it also has an action on the sintered glass disc and increases the permeability. It is believed that permeability variations on the same disc between tests are relatively unimportant since the variable is the reduction in flow rate.

It is recognized that the test procedure described does not reproduce reservoir conditions and that more precise evaluations of the quality of injection water may be required, particularly for new injection projects. This method does provide test data as to the quality of the water to be injected into a subsurface formation.

—The End.

[1] "Some Factors Influencing the Plugging Characteristics of an Oil Well Injection Water," Cerini, Battles and Jones, American Institute of Mining and Metallurgical Engineers Transactions, Vol. 165, Petroleum Division.



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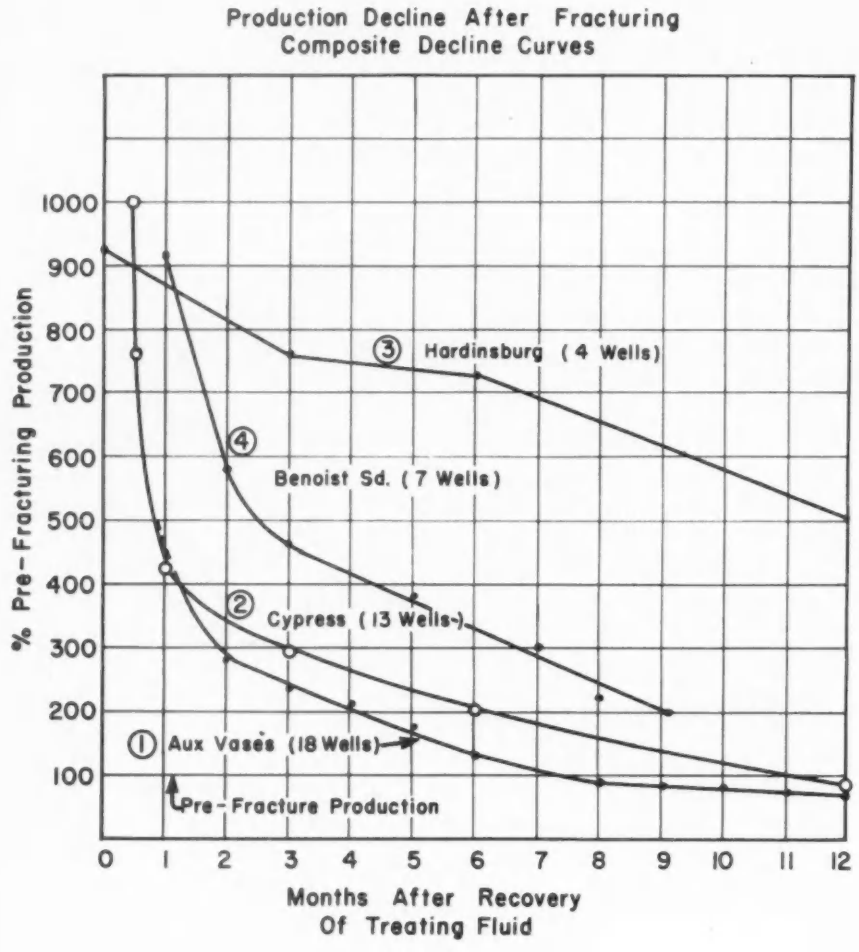

FIGURE 1

New drilling and recompletions have increased because of recent developments in . . .

Fracturing Sandstones Of the Illinois Basin

By **F. D. FURBER,** Halliburton Oil Well Cementing Co., Evansville, Ind.
and **J. C. WILSON,** Moss & Wilson, Inc., Mt. Carmel, Ill.

HYDRAULIC FRACTURING of Mississippian sandstones in the tri-state area of Illinois, Indiana and Kentucky, particularly the Aux Vases sandstone in Wayne County, Illinois, has resulted in new drilling and recompletion of abandoned wells in areas formerly thought to be noncommercial. The most noteworthy results have been those in sandstones having low permeability. Because of this emphasis upon formations of low permeability, a revision of standards is taking place with respect to what constitutes a commercial well. Definition of minimum requirements for a commercial well should be better resolved within the coming year by the performance of a number of wells now producing which were cored and analyzed.

A formation is fractured hydraulically by rapidly pumping into it a viscous kerosine-base gel containing a round grained sand. Because the permeable formation resists entry of this viscous fluid, sufficient pressure can be built up to cause a fracture. The round grained sand, called a propping agent, is carried out into the fracture by the viscous gel and deposited. This propping agent is used as a preventive against the closure of the fracture. Within a few hours, a thinning of the gel occurs such that it readily may be removed along with the natural well fluids when the well is tested or put on production.

Experience in the Illinois Basin indicated the importance of the propping agent for a successful fracture. When sufficient concentration of propping agent (1 pound per gallon or more) was used, more permanence was achieved in production increases after treatment. Coupled with this discovery came a distinct improvement in the process such that lesser quantities of both the gel and breaker agents could be used. More successful operation and lower cost attended these improvements in use of materials.

First Treatment. The first commercially successful treatment was on the Hardinsburg sandstone, East Mt. Carmel Pool, Gibson County, Indiana, in June, 1950. A very sustained natural water drive is believed to exist in this pool. Despite the low concentrations of propping agent used, this treatment and several succeeding treatments in the pool resulted in sustained production increases. At the time of this treatment several other adjustments in the gel and breaker agents had been made and successes were attributed entirely to these changes which effected a more rapid thinning of the gel fluid.

Later, when more propping agent was tried, good results became more frequent, and with respect to a given sand reservoir, less erratic. Wells which had been shot with nitroglycerin responded to formation fracture. Hitherto only new wells or those which had not been shot with nitroglycerin had been considered good prospects.

Well Selection. Following the development of a successful technique, problems of well selection became leading issues. More attention was

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given to the physical requirements of wells, such as the condition of casing and cement, the standstone characteristics and the state of depletion. It was evident that certain sandstones such as the Aux Vases, Benoist and Cypress were particularly susceptible to treatment over fairly large areas. Best assurance of good results was a previous successful treatment in the area. Table 1 gives a percentage summary of the sandstones fractured up to April, 1953, without respect to area. Certain sandstones are more prominent because of three reasons:

- Good response to fracturing.
- Prolific occurrence.
- Low permeability, a widespread characteristic.

Present activity includes the recompletion of plugged and abandoned holes. For the most part, these ventures are based on the premise of new hope for low capacity sandstones. Light recovery on drill stem tests, sand thinness, broken permeability profiles, evidence of gas and pressure coupled with low pool recovery, and certain log characteristics formerly thought unfavorable, are some of the more common bases for a recompletion venture. Many such ventures have been successful and those that have failed have done so more often because of excessive water production following treatment than by failure to obtain commercial productivity.

Also, the number of shot hole workovers, particularly in the Aux Vases formation are increasing. The trend is toward larger volume treatments, higher injection rates (more pump horsepower), and large amounts of propping agents. A number of 3000- and 4500-gallon treatments have paid out, but it remains to be seen whether larger volumes up to 10,000 gallons will be justified.

Well Performance in Various Areas. The four areas in Table 2 exemplify the type of well performance which has stimulated development of fracturing in the Illinois fields. Composite decline curves are given in the form of percentage versus time where prefracturing production is taken as 100 percent. For simplicity's sake, small shows of pre-treatment production were taken as one barrel of oil per day. A one-well example is given which gives core analysis and other pertinent data to performance.

Typical Job. Here is a typical example of hydraulic fracture treatment on one of the better wells in the South Sumner field of Lawrence County, Illinois. It is the E. Ruby 1 which produces from the Benoist sandstone.

A. Electric Log Data:
2024 ft. — 2040 ft. shaly ss.
2040 ft. — 2042 ft. hard ss.
2042 ft. — 2046 ft. oil ss.
2046 ft. — 2048 ft. hard ss.
SP max @ 2044 ft. = 70 mv. more negative than related shale.

B. Core Analysis Data shown in Table 3.

C. Drill Stem Test Data
2015 ft. to 2050 ft. 540 ft. gas, 175 ft. mud cut oil, 60 ft. oil cut mud in 2 hours. Closed in pressure 90 psi in 30 minutes.
Note: offset well showed 580 psi in 30 minutes and had better permeability.

D. Production History
Perforated 78 bullets, intervals 2029 ft. to 2038 ft. and 2042 ft. to 2046 ft.
1-16-53 Swabbing 1 barrel oil per hour
1-17-53 Hydraulic fracture treat-

TABLE 1
Fracturing Trend in Illinois Basin by Formation

FORMATION	Age	Treatments in Formation Expressed as Percent of Total Treatments	IN GIVEN FORMATION	
			Percent Completions	Percent Workovers
Aux Vases ss.	Mississippian	32.00	75	25
Benoist ss.	Mississippian	13.11	90	10
Bieshl ss.	Pennsylvanian	0.91	60	40
Buchanan ss.	Pennsylvanian	0.18	0	100
Carper ss.	Mississippian	0.18	100	0
Clore ss.	Mississippian	0.91	100	0
Corniferous ss.	Devonian	0.18	100	0
Cypress ss.	Mississippian	24.80	83	17
Degonia ss.	Mississippian	2.00	82	18
Dutch Creek ss.	Devonian	0.18	100	0
Hardinsburg ss.	Mississippian	5.29	55	45
Jackson ss.	Mississippian	1.28	86	14
McClosky ls.	Mississippian	0.18	100	0
Mansfield ss.	Pennsylvanian	0.36	100	0
Paint Creek ss.	Mississippian	1.46	87	13
Palestine ss.	Mississippian	.56	67	33
Parker ss.	Pennsylvanian	0.18	100	0
Penn. (unclassified)	Pennsylvanian	0.92	80	20
Renault ss.	Mississippian	0.18	100	0
Rosiclare ss.	Mississippian	0.36	100	0
Tar Springs ss.	Mississippian	8.21	84	16
Trenton ls.	Ordovician	0.18	0	100
Waltersburg ss.	Mississippian	6.39	57	43

TABLE 2
Key to Production Decline Curves

Curve No.	Formation	Area	Depth	Sand Thickness	Formation Pressure	Remarks
1	Aux Vases Sandstone	Clay and Wayne Counties, Ill.	About 3000 ft.	10 ft. to 30 ft.	About 1200 psi	Low electric resistivity. Unusual amount of gas after treatment and wells flow 1 to 6 months.
2	Upper Cypress Sandstone	White County	About 2600 ft.	10 ft. to 20 ft.	About 1100 psi	Most wells flowed 1 week to 1 month after treatment.
3	Hardinsburg	Gibson and Knox Counties, Indiana.	About 1800 ft.	10 ft. to 20 ft.	About 300 psi	Unusual natural water drive. Most wells make water.
4	Benoist Sandstone	Lawrence County, Ill.	About 2000 ft.	10 ft. to 15 ft.	About 600 psi	Considerable variation in sand development. Shaly to clean sand.

TABLE 3
Core Analysis Data

SAMPLE No.	Depth Ft.	Permeability Millidarcys	Porosity Percent	RESIDUAL LIQUID SATURATION PERCENT PORE SPACE	
				Oil	Total Water
1	2026.5	0.0	....	....	....
2	2027.5	0.0	....	....	....
3	2028.5	0.0	....	....	....
4	2029.5	0.5	15.4	8.4	51.1
5	2030.5	0.0	....	....	....
6	2031.5	0.2	14.2	16.9	42.2
7	2032.5	0.9	13.4	9.0	44.2
8	2033.5	2.3	15.9	13.2	35.8
9	2034.5	0.7	17.1	12.3	43.3
10	2035.5	1.8	15.2	14.4	42.8
11	2036.5	0.9	17.6	15.9	46.1
12	2037.5	0.0	....	....	....
13	2038.5	0.0	....	....	....
		shale or sandy shale, hard			
14	2041.5	54	17.6	19.9	28.6
15	2042.5	36	14.0	27.9	25.0
16	2043.5	32	15.4	21.4	22.0
17	2044.5	13	15.0	14.0	24.6

ment 1500 gallons gel, 2400 pounds propping agent at maximum 2100 psi pump pressure.

1-20-53 Pumping 23 B.O/trace water per day

1-24-53 Pumping 81 B.O/trace water per day

1-31-53 Pumping 126 B.O/trace water per day

2-16-53 Pumping 91 B.O/trace water per day

4-13-53 Pumping 46 B.O/trace water per day

5- 5-53 Pumping 44 B.O/trace water per day

Cumulative Oil Production 1-19-52 to 5-6-53: 6708.74 barrels.

Selection of Prospects. Some factors currently being considered in selecting wells for hydraulic fracturing in the Illinois basin are:

• GENERAL

A. Wildcats and Development Wells.

1. Evidence favorable to fracturing has been moderate to light drill stem test recovery, coupled with evidence of reservoir energy, such as gas or gas cut mud. Failure to record a high closed-in pressure may not be unfavorable since low capacity formations in a high-pressure reservoir often do not record a fully developed pressure in 15 or even 30 minutes.

2. After completion of well when sand is opened for testing, a natural production of 1 to 25 barrels of fluid per day in an average sand thickness would be indicative of low effective permeability and point toward fracturing.

3. Failure to obtain commercial productivity through shooting with nitroglycerin, coupled with light cleanout following shot would point to fracturing before abandonment.

4. Fracturing may be advantageous in fine grained or dirty sands.

B. Recompletion of Plugged and Abandoned Wells.

1. Reconsideration of abandoned wells where only electric logs are available has proven profitable in fairly thick sections where abandonment was due to low electric log self-potential, often interpreted erroneously as meaning lack of commercial permeability. Low self-potential may be due to broken permeability caused

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WILSON

Double-Displacement PAT. PEND.

ROD PUMP

for large-volume wells

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The "Double-Displacement" Rod Pump has two principal applications: Where it is desired to lift a greater volume of fluid to increase daily oil production, or produce the same volume of fluid at a slower pumping speed. The effective plunger area of each size "Double-Displacement" Pump is greater than the largest tubing pump used with any given size of tubing.

The pump is an insert type, traveling barrel, bottom hold-down assembly made up of two plungers and two barrel tubes which work simultaneously with a single set of valves. It seats in a standard cup type seating nipple or the old working barrel made up in the tubing. Plunger and barrel combinations are available in Tuff-Temper heat treated tubes and chrome plated one-piece plungers; Precision steel tubes, either plain or chrome plated, with Precision sectional metal plungers; Flexite Plungers and composition Ring Plungers with either plain or chrome plated barrel tubes. Pumps made of corrosion resistant materials can be furnished for corrosive wells.

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H-F Precision PLUNGER

H-F "FLEXITE" Plunger

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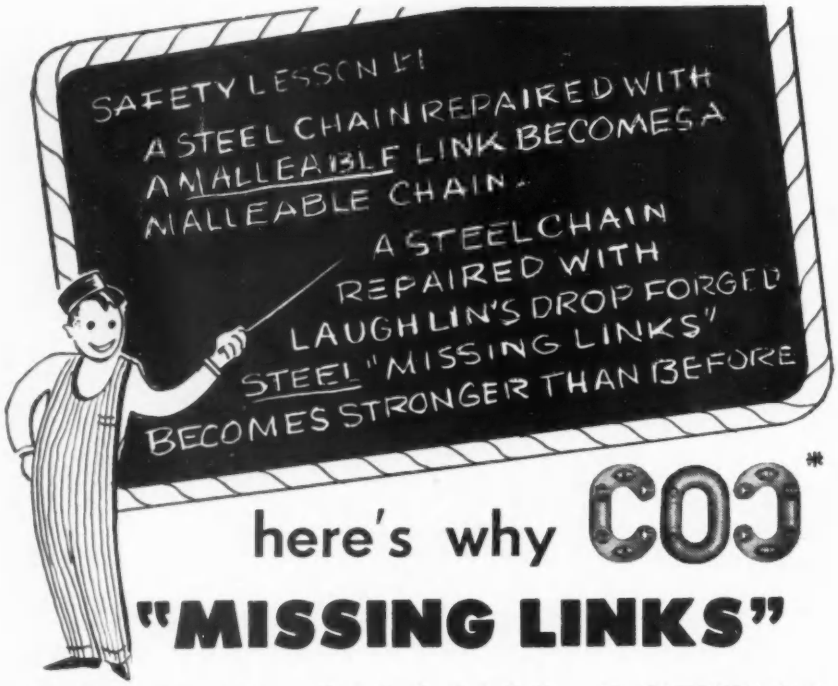
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by interbedded shaly or calcareous streaks.

2. Drill stem tests, samples, or core analyses also pointing to abandonment because of low permeability characteristics have led to profitable recompletion ventures.

C. Shot Hole Workovers.

1. Earlier successes were based on evidence of light shots and/or light cleanouts of one week or less following shooting. Usually selected were wells which had a history of low recovery. Most workover treatments were 1500 gallons.

2. Present trend toward larger volume treatments of 3000 gallons or more is meeting with some success on Aux Vases sandstone wells with fairly good primary recoveries (greater than 15,000 barrels.)

• Electric Log

A. Detection of a water problem. Evidence of a resistivity gradient in the pay sand has in most instances been an indicator of considerable water production following treatment.

B. Completion Problems. Close water zones which need remedial cementing before treatment are revealed by the electric log. Experience has shown that communication of treating fluids to close water zones cannot be controlled by selective perforation alone.

C. Drill Stem Test. Drill stem test fluid recovery has been a good indicator of the relative productivity of wells after fracturing. However in the common case of light fluid recovery the danger of water production after fracturing may not be revealed.

D. Core Analysis. Permeabilities of about 5 to 50 millidarcys and porosities of 15 percent to 18 percent have characterized sandstones which respond well to fracturing.

E. Secondary Recovery Operations. Present thinking points toward the careful application of fracturing to producers in water floods, limiting size of treatments. It is the general belief that it is better not to fracture wells destined for input. —**The End**

ACKNOWLEDGMENTS

The authors express their thanks to B. D. Brown, division engineer, and J. R. Williams, district engineer, Halliburton Oil Well Cementing Company, Evansville Division, for their aid in collecting production data for this paper. The method of presenting decline curve data is credited to C. R. Fast, "A Study of the Permanence of Production Increases Due to Hydraulic Treatments," Technical Note 103, reprinted from *Journal Petroleum Technology*.

57% INCREASED RECOVERY

brought this operator $161.06 more per day

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Records for a 2-month test period proved how much more he could make with low temperature separation, using the BS&B Glycol Injection System with Stabilizer. On the first test, operating old-style first stage separator at 800 p.s.i. and at 70°F., recovery was 19.75 barrels per MMSCFD of sales gas. Then the BS&B Glycol Injection System with Stabilizer was put into operation. Separator pressure was 940 p.s.i.—temperature 10°F, on the second test. Stock tank recovery went to 31.03 barrels per MMSCF of sales gas . . . an increased recovery of 57% . . . or an increased daily revenue of $161.06 to this particular operator.

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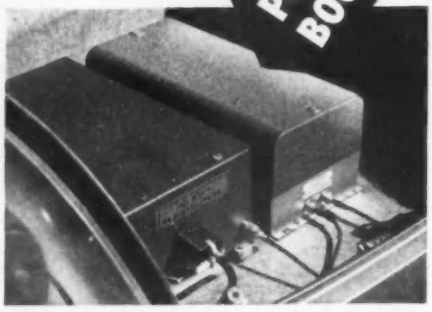

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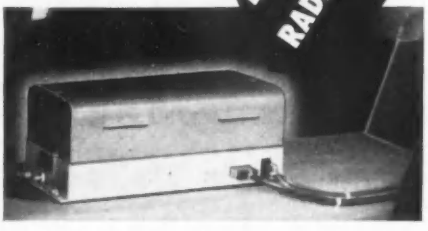
RADIOPAK



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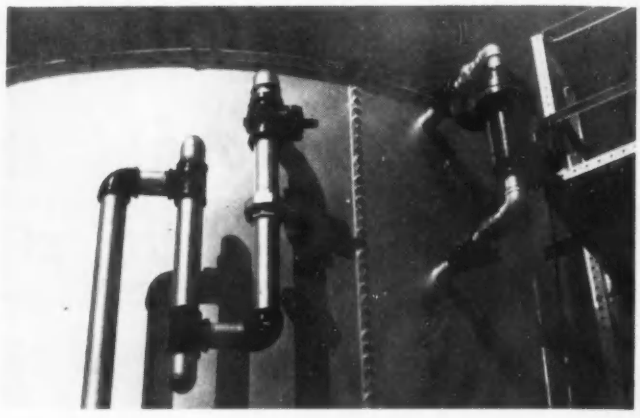
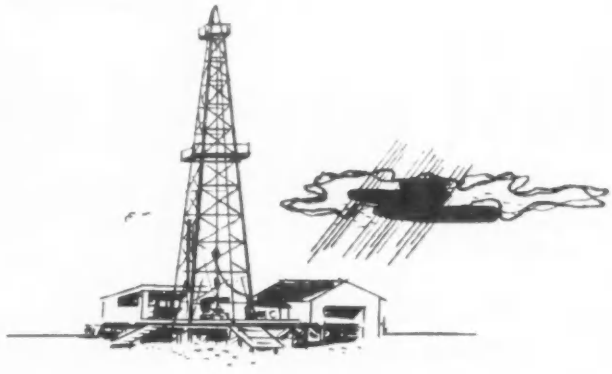
How to Seal Off Tank Fill Line



Install a U-tube arrangement on the fill line of a water tank used to store flood water to prevent air from entering the tank should the fill line be disconnected at the ground for any reason. Eliminating air from coming in contact with salt water used in a water flood project minimizes the treating problem. Shown here is the upper part of a water storage tank that supplies the flood water to an injection pump. The water has already been properly filtered and treated, and in order to keep air out, about four ounces of gas pressure are maintained on the tank.

A U-tube section is made into this line near the connection into the upper part of the tank. If this line needs to be disconnected at the surface, water in the vertical run alongside the tank will drain, but that water in the U-tube section will remain in the pipe. This water forms a seal against the atmosphere so that air will not enter the tank. To prevent a syphon effect from draining the U-tube, the bull plug at the top of the left leg is removed until the line is ready for service again. When the water begins to flow into the fill line and overflows out the top of the tee in the U-tube, the bull plug is replaced. Air never gets into the line to contaminate the gas cushion on top of the water.



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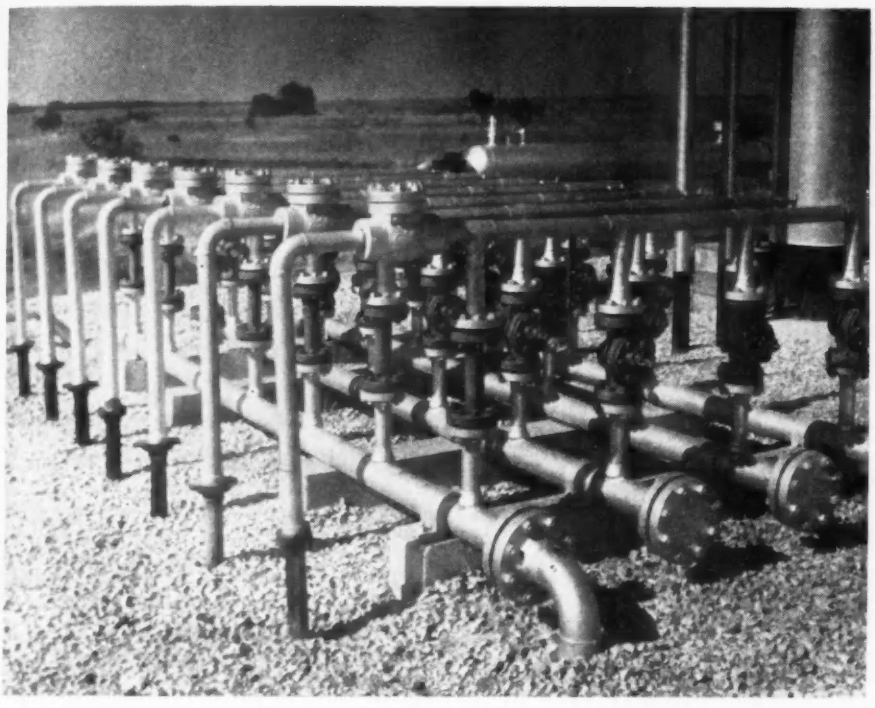

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The manifold shown here handles relatively high-pressure wells on a lease that also has low-pressure wells. Since it was not known how long the high-pressure wells will hold up, it is desirable to be able to flow them into the low-pressure system when the flowing pressure drops to reasonable limits. Also, these wells eventually will produce sizable quantities of water, and it will be necessary in the future to treat the produced fluids.

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Lubricating Polish Rod Stuffing Box

Circulate water through a housing mounted on top of the stuffing box surrounding the polish rod to extend the life of the packing element. This particular well was known to head occasionally, followed by a period of gas flow. It was during the time that gas was produced that the packing element would dry out, and while the pump continued to operate, the polish rod would wear out the packing long before it normally should have to be renewed.

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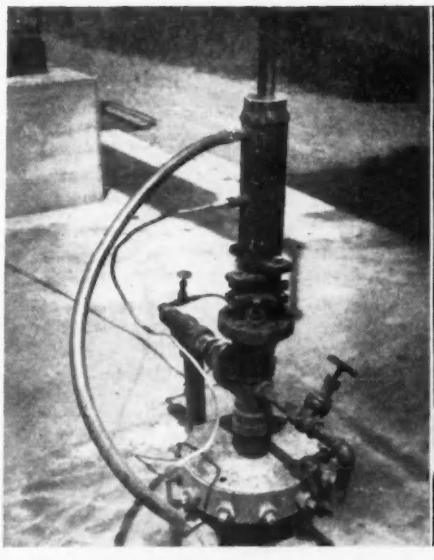
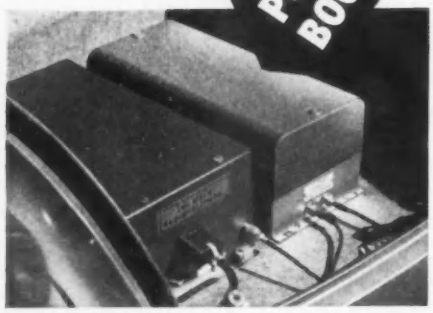


FIGURE 1

FIGURE 2

NEW...

POWER BOOSTER



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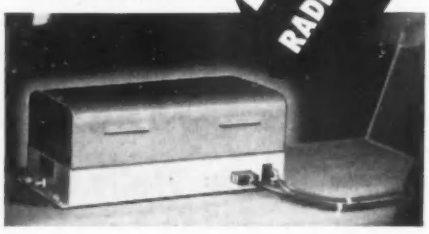

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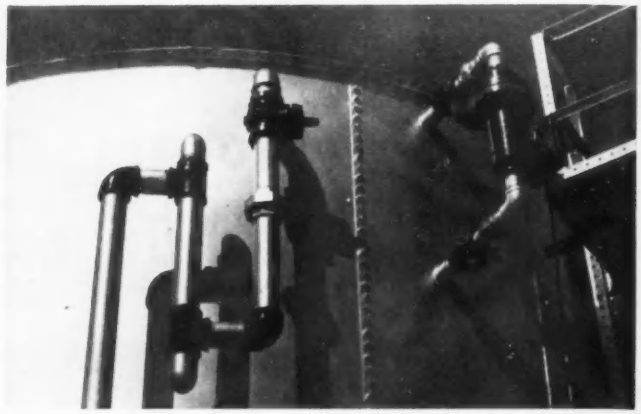

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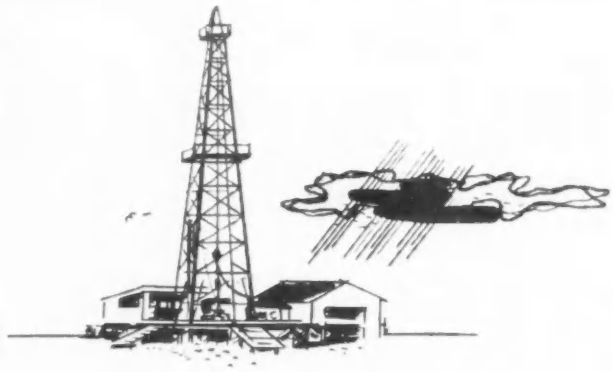

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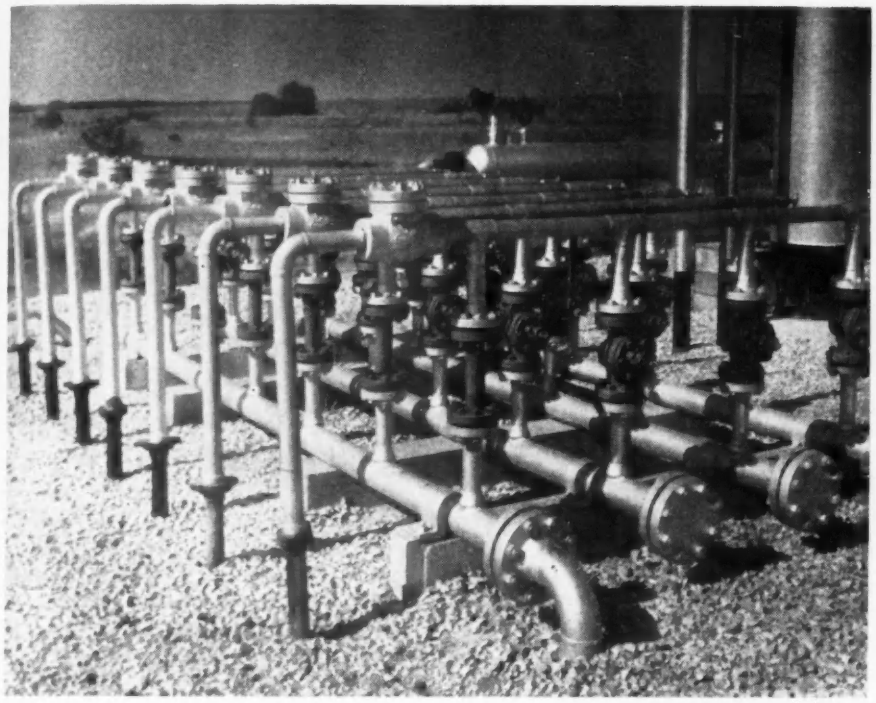

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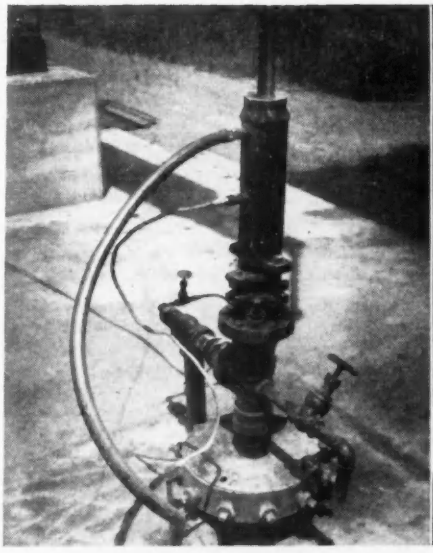

FIGURE 1

FIGURE 2

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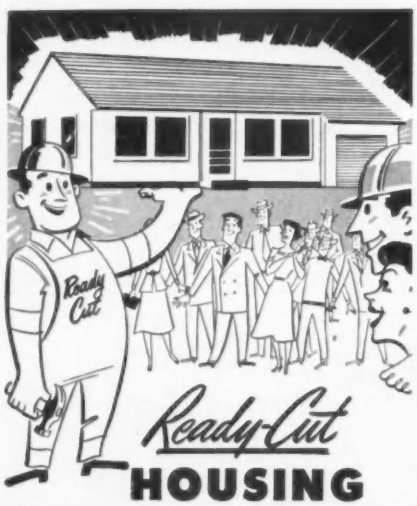

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bottom. The top of the cylinder was closed off, but only a close fit was made around the polish rod. There was no packing in the top of the cylinder.

An inlet and outlet connection to the side of this cylinder permitted water to circulate through the chamber. The inlet, shown at bottom (Figure 1), is a short piece of quarter-inch copper tubing connected to one-inch pipe. Outlet at the top is a short section of one-inch rubber hose which is attached to the water return line.

Water was circulated by means of a small gear type pump which was powered off the flywheel shaft of the engine driving the pumping unit (Figure 2). The sheave size on this small pump was selected to deliver the quantity of water needed. The metal box in the background is a water reservoir which supplies the pump with a flooded suction. The 1½-inch connection to the reservoir tank is the return line from the water cylinder above the stuffing box. Discharge from the pump is connected by means of a copper tube to a one-inch pipe placed along side the 1½-inch return line. This device has resulted in little trouble with prematurely worn out packing glands in the stuffing box.

Making Rod-Tubing Rack

Install a permanent rod and tubing rack on wells that have to be pulled and serviced frequently. Such a rack was installed on a West Coast well. It consists of six pairs of 2½-inch pipe legs driven into the ground at intervals of about five feet, and spread some five feet apart. Each pair of pipe legs is tied together by hooking a shaped piece of sucker rod into the open ends.

The shape of these rods forms a cradle into which rods or tubing can be placed during the servicing operation. Gravel spread around the well head makes it easy for the pulling unit crew to tail in rods easily and safely.

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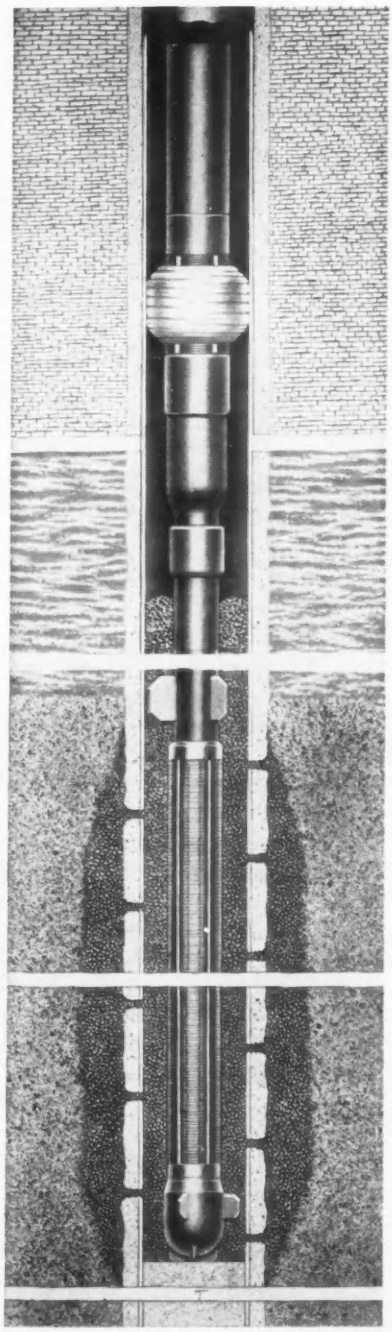

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The Layne & Bowler Company has the "KNOW HOW" at every depth.

Because the Gravel Pack can neither deteriorate nor enter the screen and because it permanently supports the formation and filters the flow, you are not confronted with the frequent expense of pulling tubing to replace sanded up screen and sand cut parts and other expenses involved in reworking wells.

Gravel Packing controls the productive sands. It surrounds the strainer with a natural filter, coarse enough for the oil to flow through, yet fine enough to retain the oil sand in its natural state of formation. Acting as a baffle, the gravel distributes the flow through the countless channels, lowering the velocity and preventing disruption of the fine grains of sand resulting in longer life for the well and equipment.

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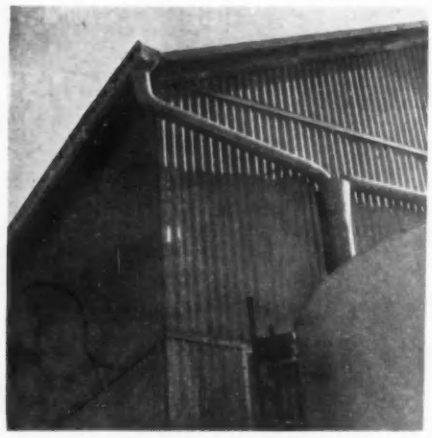
HINTS . . .

Collecting Rain Water



Provide fresh water in remote arid areas by collecting rain water from the roofs of small metal buildings. The building pictured houses a small compressor plant which is part of a gas injection project. Fresh water is needed for washing up, for adding to the engine jacket water, and for other utility purposes. Unless such places are near fresh water systems, water must be hauled to the site.

By going to some additional expense in adding galvanized gutters and collecting downspouts, all the water falling on the roof of the building can be saved. At this station, a 100-barrel welded tank serves as storage for rain water collected from the roof. Downspouts from both gutters empty into this tank which is equipped with gauge glasses so that the station operator can tell at a glance how much fresh water is in the tank. A small centrifugal pump is available to provide pressure when needed.

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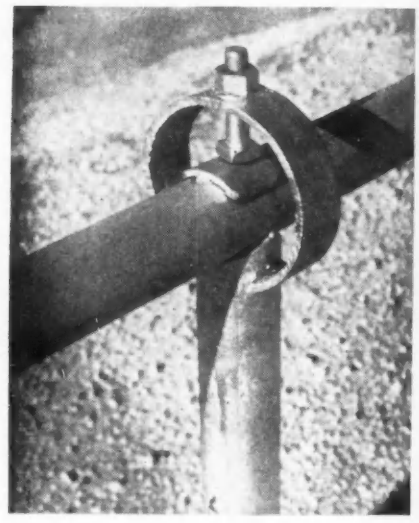
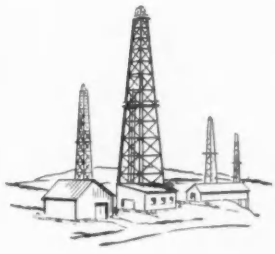


Anchoring Gas Line

Anchor flow lines which carry high-pressure gas to a gas injection well at little cost by making this simple pipe hold down clamp. Because of the expansion and contraction inherent in high-pressure injection lines, they are generally placed above the ground to permit some movement. However, it is necessary to firmly hold them in place to prevent breaking a welded joint or fitting.

The two-inch high-pressure gas line shown is supported by vertical legs made of 2½-inch pipe set in concrete foundations. The gas line rests in a saddle cut in the 2½-inch support so that the high-pressure line will not slip out of place. The injection line is held firmly in position by a hold down made from a 2½-inch wide ring cut from 5½-inch casing and welded to the vertical support.

Pressure to hold the gas line in place is supplied by an inverted bolt, the head of which rests on a steel pad that has been tack-welded to the gas line. This bolt fits through the casing ring and screws into a nut welded to the top of the ring. By screwing the bolt into the nut, the



Do your check valves last less than 30 days?

If they do, then you will be interested in Kennametal Balls and Seats. You'll find that they can give 20 times longer service than alloy steel*, resist shock, pitting, sand cutting, and corrosion far better. (Often they last for a year or more, even in severe sand cut fluid.) Round tripping costs can be greatly reduced, and production increased due to more continuous pumping.

Kennametal sintered-carbide Balls and Seats retain bottom hole valving efficiency due to their extreme "diamond-like" hardness. Their wear and corrosive resistance provide unexcelled performance in sand, sour crude, hydrogen sulphides, water and gas cut fluids.

Consider that a single round tripping of string costs many times more than the highest-priced or largest Kennametal Ball and Seat. For this reason, many fields are standardizing on Kennametal. Also, it is for this reason that they are incorporated in most leading pumps as standard equipment. A complete line of Kennametal API sintered carbide Balls and Seats (in both plain and rib styles) is available from your supplier.

**As proved by comparative performance in both the Mid-Continent and West Coast Fields.*

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Quality Sintered Carbide API Balls and Seats

Manufactured by

Kennametal Inc., Latrobe, Pa.

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distance between the pad and the ring is shortened, thereby decreasing pressure on the pad. The line is held firmly in the saddle of the support by unscrewing the bolt which causes the bolt head to bear down on the pad welded to the high-pressure injection line. Several of these hold downs support the weight of the gas line and hold it in position. Expansion and contraction of the line can take place to cause the pad to move beneath the bolt head, without interfering with the hold down.

Stopping Metal Door

Hold a heavy metal door of a prefabricated warehouse and office in the open position by a unique doorstop made in the welding shop. This doorstop automatically locks the door in position and holds it in place until the stop is released.

Set a short piece of two-inch pipe in a concrete footing, and extend the two-inch pipe several inches above the bottom of the door. Make the catch from a piece of strap steel about eight inches long, the front end of

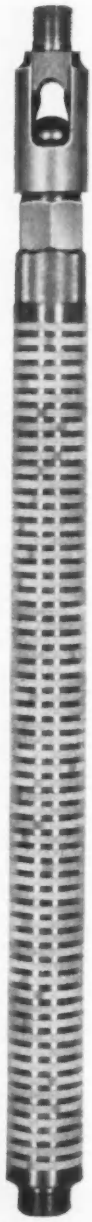
which is tapered to a point and notched immediately behind the tapered section. This notch is slightly wider than the width of the door.

Spring-load this catch by attaching a small coil spring to the rear end and anchor the spring to the supporting two-inch pipe as shown. A limit stop to the travel of the catch is made by welding a short cross piece to the two-inch pipe so that the spring pulls the catch against the stop. Hinge the catch through the center of the upright support.

In its normal position, the catch is nearly horizontal. When the door is shoved against the stop, the tapered end causes the catch to tip downward to allow the bottom of the door to fall into the notch. The coil spring holds the catch in place until released. Pull on the door while pushing down on the tapered end to release the door. Besides its usefulness during unloading, the stop holds the door open permitting a breeze to blow through the building in the summertime.

Protecting Separator

Install plate flanges face downward to protect a bursting plate installed on the separator from water and dirt. This bursting plate protects the separator from excessive pressure overloads and will burst at a predetermined pressure. While it is easier to mount the bursting plate flanges in the gas discharge line so that the plate faces skyward, such installation has the disadvantage of collecting water



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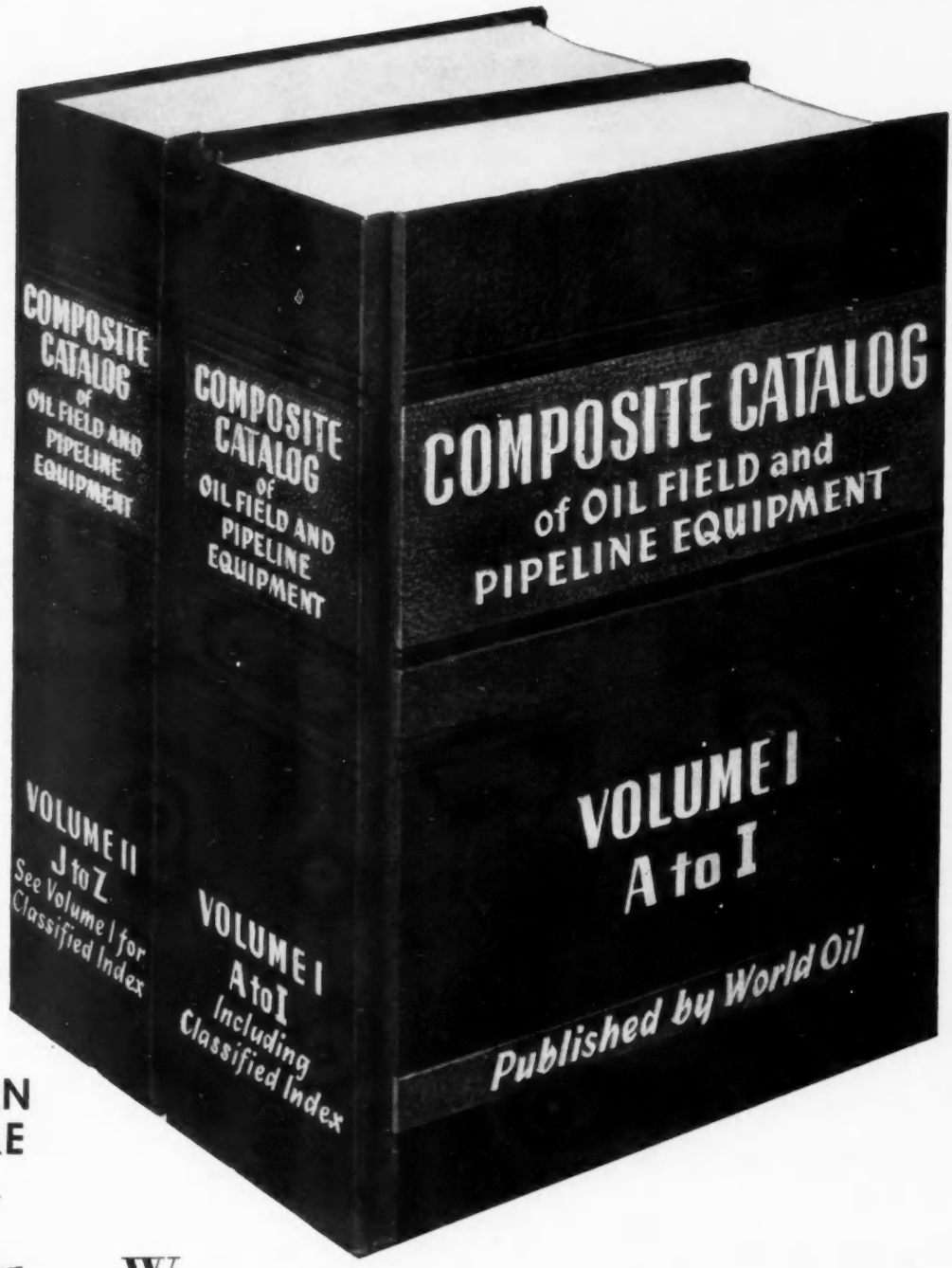
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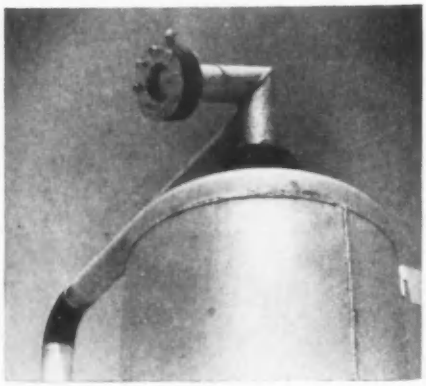
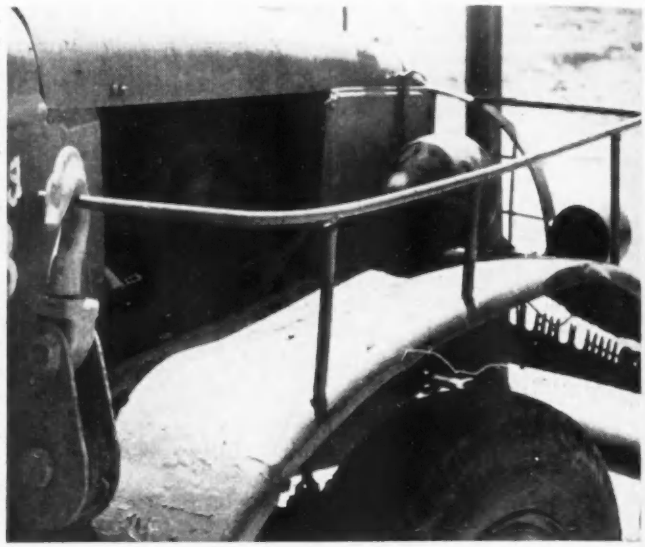


and dirt which may clog up the opening.

By welding the two-inch nipple containing the bursting plate to the gas discharge line at an angle less than horizontal, the opening in the outside flange tilts slightly downward so that water and dirt will not settle in it. To avert any danger of the separator tipping over should the bursting plate rupture due to excessive pressure, adequate anchorage should be provided. Otherwise, the exhaust of gas and fluids downward may tend to push the separator over.

Hauling Tools in Rack on Truck Fender



A tool and "carry-all" rack made of sucker rod material and welded to both front fenders of a pulling unit facilitates hauling many items used in well servicing work.

One well servicing contractor devised these handy utility racks welded directly to the heavy-gauge steel fenders of his pulling unit. Made of five-eighths-inch sucker rods, the top rung is formed as shown, tack-welded to the body at one end and welded to the head light guard at the front. Three vertical risers support the curved rung off the fender.

With two such carrying racks on the truck, it is possible to store and haul many small items, such as snatch blocks, hooks, etc. When the hood is in position during travel from one location to another, larger objects can be placed inside the railing.

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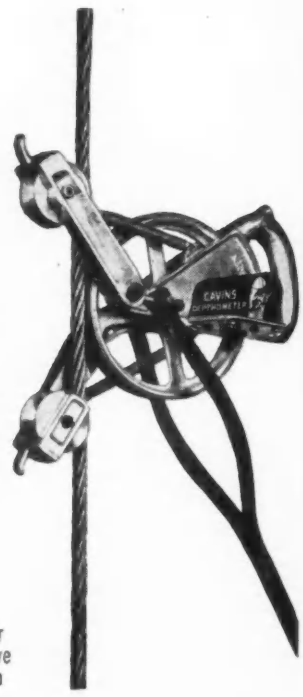

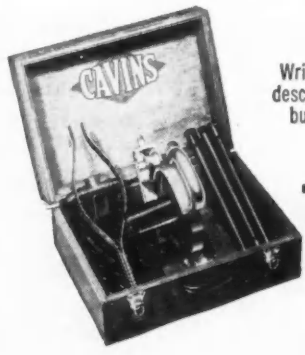

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Something new! An inch-thick blanket of plastic particles that acts like a liquid floating roof inside tanks and promises to . . .

Reduce Evaporation Losses 80 to 90 Percent

● What it means . . .

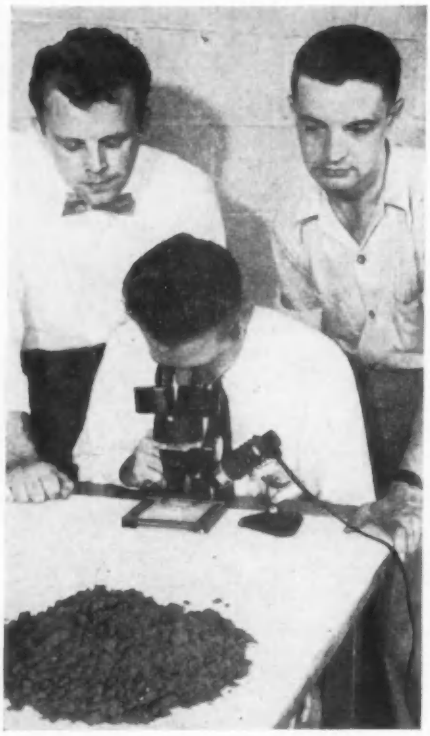
. . . evaporation losses cost the oil industry hundreds of millions of dollars each year. Losses in pipe line systems alone are near $60 million annually. And this is small compared to losses in stock tanks, refineries and at tank farms. A large percent of this loss can be charged to tankage. And here at last is a development that promises to slash these losses drastically.

PROBABLY THE outstanding new development in crude and products pipelining is a foam blanket that floats on oil inside storage tanks to reduce evaporation losses. It promises savings of hundreds of millions of dollars a year to the refining and pipe line industries.

The blanket is made up of millions of hollow, balloon-like spheres containing a sealed-in gas—usually nitrogen. They range in size from 2/10,000 to 36/10,000 of an inch.

When poured in sufficient quantity on top of crude or products in a storage tank, they spread into an even and dense layer over the surface of the liquid. They form a fluid-like floating roof. When the layer is about an inch thick, it virtually stops all evaporation of crude oil into the overlaying air inside the tank, except where the sides of the tank are wetted during outflow.

This development was reported recently by the Chemical and Physical



RESEARCH TEAM that developed the product: Richard D. Croft, Dr. Frank Veatch (at microscope) and Ralph W. Burhans. Powdery pile in foreground contains several million of the balloons.

IN LABORATORY TESTS, foam like this has been standing for more than two years without sign of deterioration. Researcher Croft measures float of balloons.

PLASTIC BALLOONS are poured from a package by Dr. Veatch. Samples of the new material are now available to the industry for experimental use.

Research Division of The Standard Oil Company (Ohio).

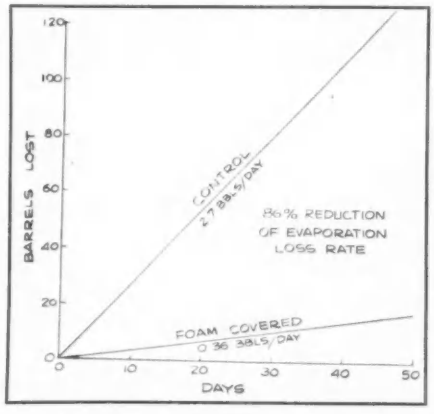
Tests under a variety of conditions have indicated an evaporation loss reduction in the region of 80 to 90 percent. Typical results obtained by direct gauging are given in Figure 1. It shows an 86 percent reduction in the evaporation loss rate of ordinary crude oil in 88-foot diameter, cone-roof storage tanks with about two weeks working frequency.

Losses Heavy. What this new development means to the industry can best be gauged by taking a look at losses today. Eight companies recently reported losses on cone-roof tanks. The breathing losses (caused by inhalation and exhalation resulting from temperature change) for 80,000-barrel cone-roof tanks filled with gasoline of five pounds per square inch true vapor pressure, averaged 1895 barrels per year. And each time a tank is filled and emptied loss runs about 120 barrels. If a tank is filled and emptied 25 times a year this comes to 3000 barrels—making a total loss for the year in the neighborhood of 5000 barrels.

Figure the cost at 10 cents a barrel, and this represents an annual loss of $21,000.

Under similar conditions where an 80,000-barrel cone-roof tank is filled and emptied of crude 25 times a year, the breathing and filling loss will run about 3000 barrels annually or about $2000 to $10,000 a year.

Insofar as gasoline is concerned, the industry has made great progress in minimizing losses, by such measures as manifolding 6 or 8 cone-roof tanks to a common vapor header that ties to a floating roof tank. When these methods are used in combination with the new foam blanket, it is possible



GAUGING RESULTS of 88-foot diameter worked tanks show a reduction of 86 percent in evaporation losses where the new plastic foam is applied.

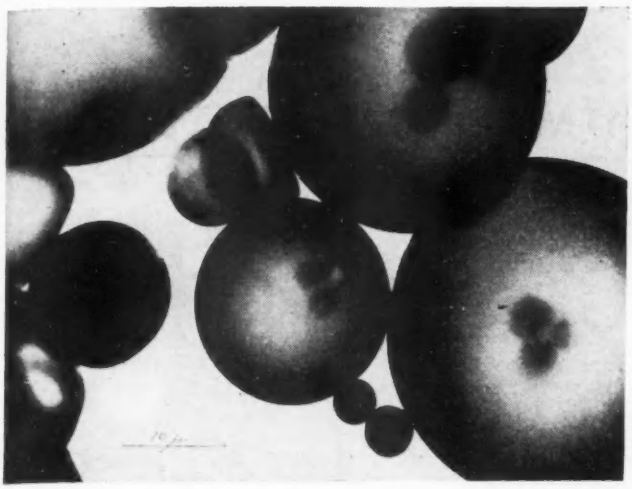
that storage tank losses may approach 0 percent.

However, few companies have taken efforts to conserve crude in tankage, because of the high installation costs of vapor systems and floating roof tanks. And there are some individual companies that sustain evaporation losses that run over $1 million a year. To these companies, this new development will represent rich profits.

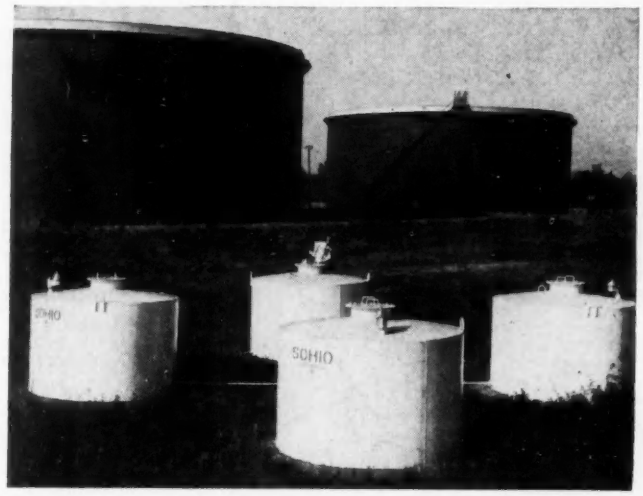
Installation Technique. The new plastic covering, called microballoon, is installed simply by pouring the dry powder through open hatches. Usually some form of surface agitation or an oil spray has been used to help spread the covering intitially. The fluidity of the foam layer enables it to flow around supports, swing lines and other deadwood in the tank, while keeping the liquid surface sealed as the level moves up and down in the tank.

The difficulties of reading a gauging tape properly in presence of a layer of viscous foam is handled adequately by a simple protective floating well attachment on the tape line. In a number of cases, the floating wells have been installed permanently in the tanks.

Slight or no modifications to tanks



MICROSCOPIC VIEW of the plastic balloons. They range in size from 0.0002 to 0.0036 inch. Inside of each hollow sphere is nitrogen.



EXPERIMENTAL TANK FARM was used for first development work on the balloons in actual field use.

are required for the installation of foam blankets. Where needed, protective devices may be employed to prevent accidental loss of the covering into pipe lines.

Quantity and Cost. Most of the large-scale test work has been done with a one-inch thick layer of microballoon foam. The optimum economic thickness is not yet sharply defined. For large tanks it will probably be in the region of ½ to 1 inch. The quantity required is proportional to the square of the tank diameter for a given thickness of foam layer. For the product currently being used the following quantities are needed for one-inch foam layers:

Tank Diameter	Pounds of Microballoons
20 feet	250
50 feet	1600
100 feet	6000

One-half inch thick layers would take one half the above quantities.

As yet the cost of the new material has not been set, but a preliminary figure of 80 cents a pound has been used for economic calculations.

As for life of the new material, time alone will give the final answer. Examinations after two years of service show such slight changes that a lifetime of several years is anticipated.

Effect of Storage Conditions. In general, it appears that the conditions which increase evaporation losses such as higher storage temperatures, poor tank conditions, frequent working, and others are the ones which increase the relative value of the product as a conservation technique. Tests with worked and static tanks, of various sizes and conditions, support the general performance effectiveness outlined above.

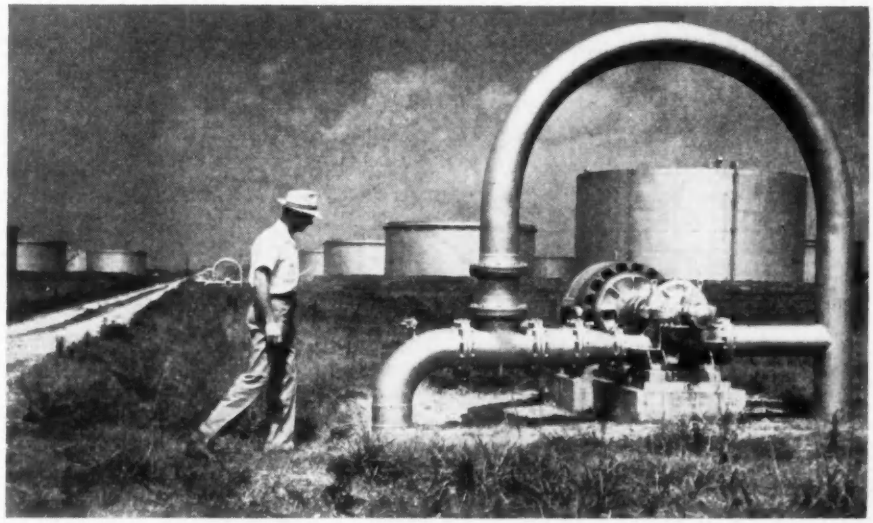
One of the first problems that crops up regarding its use in pipe line tankage, is what will happen if a portion of the covering is lost into the pipe line. Fortunately, this factor is negligible.

The particles are so small (present product averages 0.001 inch in diameter) that liquid suspensions can be pumped through precision pumps without damage. Hydraulic pressures of a few hundred pounds in the pipe lines are sufficient to collapse the microballoons, making them even smaller. They would eventually end up in the tank bottom settlement and water. This would also be true of the microballoons which deteriorate in service in the tanks.

Fire Prevention. It has been found that microballoons substantially reduce the concentration of hydrocrabon in the tank vapor space. The normal vapor composition in storage tanks varies all the way from too rich to burn inside the tank to too lean depending upon a variety of factors. Since the covering invariably reduces the hydrocarbon concentration, in some cases it will make the vapor space less dangerous, in others more dangerous. Whether there will be an average gain or loss on the vapor space combustibility is not yet known.

Availability. Up to the present, the product has been manufactured and tested on an experimental basis. It should be available in substantial quantity within a few months. Experimental samples can be obtained from The Standard Oil Company (Ohio).

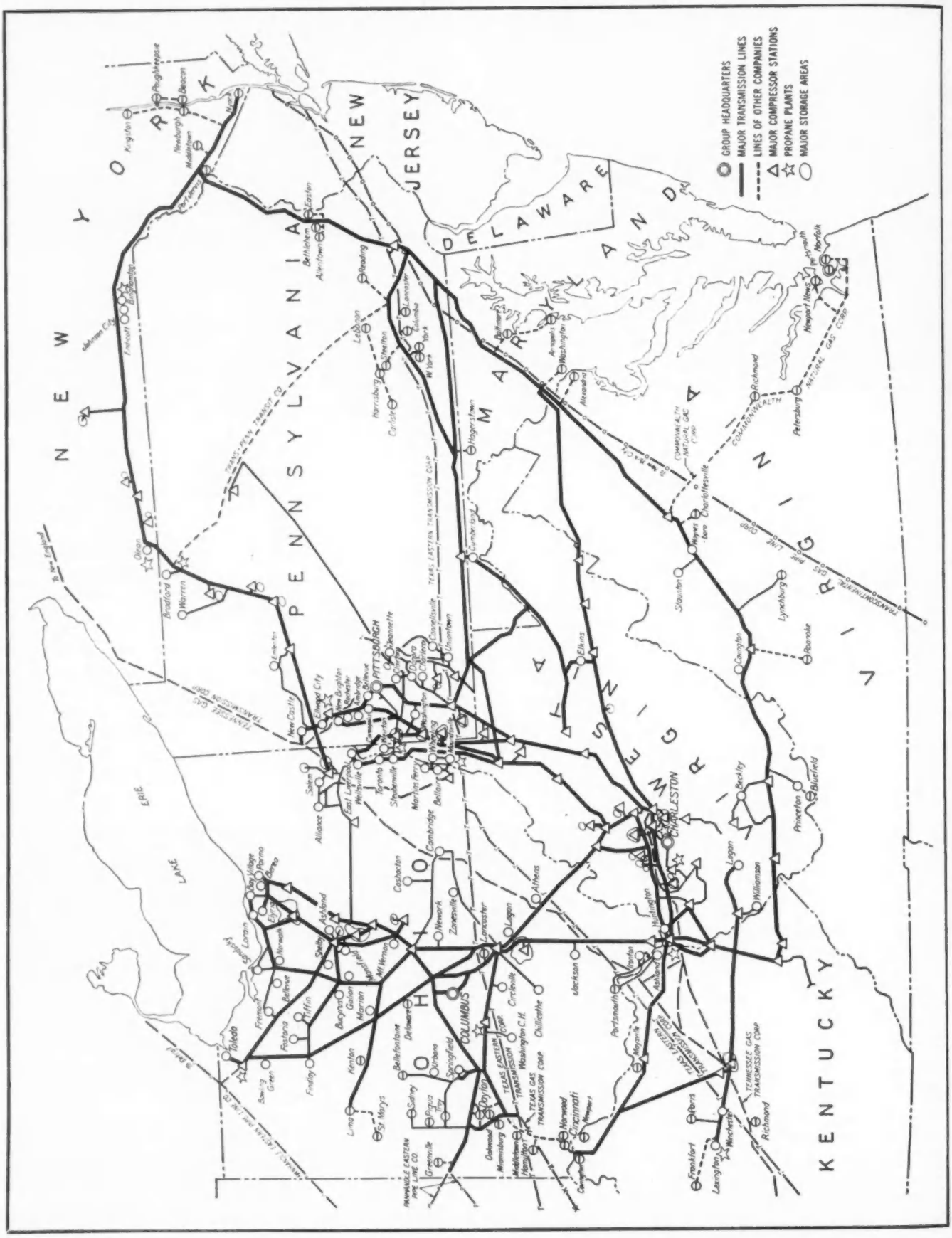
—The End.

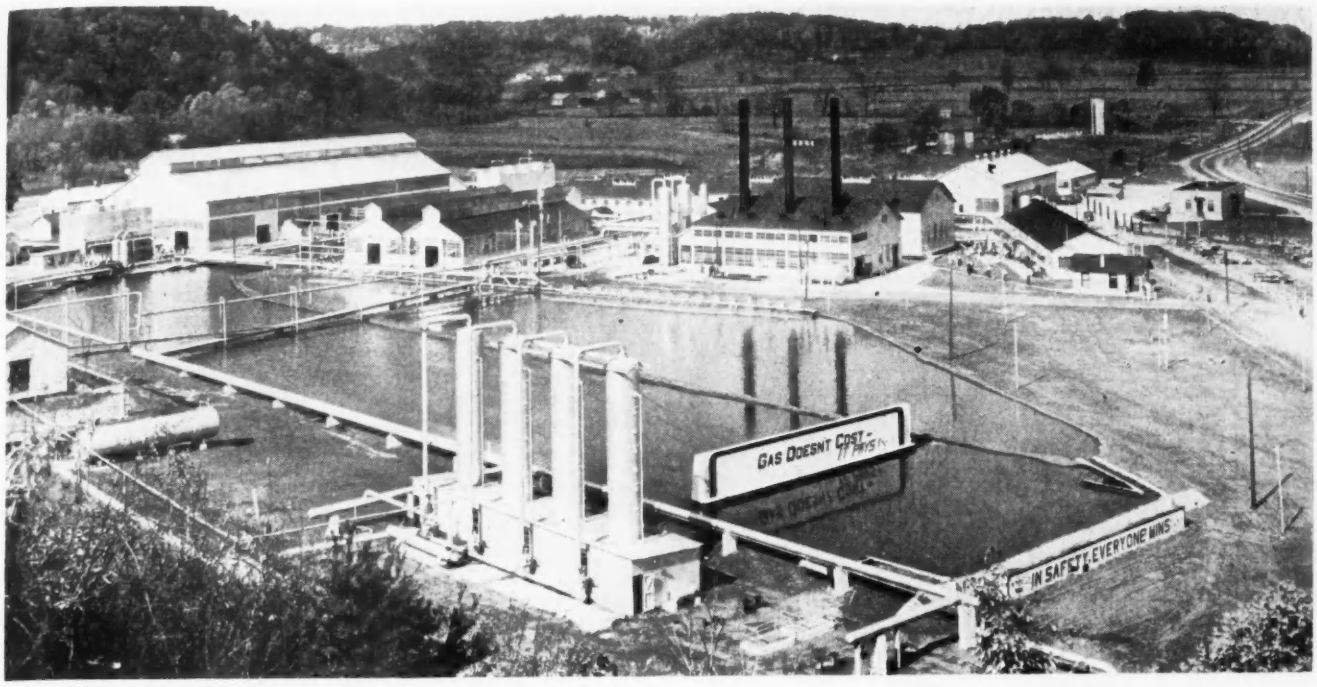


MANIFOLDED CONE ROOF TANKS are used by some companies to reduce evaporation losses. Addition of plastic to existing systems may reduce losses to near zero.

Map of the Month

COLUMBIA GAS SYSTEM, INC.





CRAWFORD COMPRESSOR STATION, once the world's largest gas-operated natural gas compressor station, helps keep gas moving through the transmission lines of The Ohio Fuel Gas Company, a Columbia Gas System affiliate. Station is about 35 miles south of Columbus, Ohio.

Columbia in 7th Year Of Expansion Program

AN EXPANSION program begun by Columbia Gas System, Inc., at the end of World War II is now in its seventh year with expenditures for 1953 expected to total $67 million.

Much of the money will be spent to enlarge and extend a system of field, transmission and distribution pipe lines that already totals about 34,000 miles in length.

A booming demand for natural gas in Columbia's territory began when prices of competitive heating fuels rose after World War II. In an effort to keep pace with the demand, Columbia has spent an average of $48 million annually on new facilities in the postwar period.

Columbia's affiliates distribute natural gas at retail and wholesale to about 2½ million customers in the mid-Appalachian area through an extensive pipe line system in Kentucky, West Virginia, Ohio, Virginia, Pennsylvania, New York and Maryland. The companies in the system can deliver approximately 3.2 billion cubic feet of gas in a single "peak" day.

Gas Sources. Columbia gets 27 percent of its gas supply from the Appalachian area, with the remainder delivered from the Southwest by transmission companies. These include Texas Gas Transmission Corporation, Texas Eastern Transmission Corporation, Tennessee Gas Transmission Company, and Panhandle Eastern Pipe Line Company. Those four companies deliver about 950 million cubic feet a day to Columbia's affiliates.

To meet the unfilled demand for gas in Columbia's area, construction is under way on a new 860-mile pipe line which will deliver gas to the system from South Louisiana. It is to be owned and operated by Gulf Interstate Gas Company, and on its completion in November, 1954, the 30-inch line will deliver up to 375 million cubic feet daily to Columbia's lines at a point in northeastern Kentucky.

Columbia's gas sales have more than doubled in the past ten years, increasing from 166 billion cubic feet in 1942 to 430 billion in 1952. It is estimated the system's sales will total 700 billion by 1957.

Keeping the gas moving through the company's pipe line network are 134 compressor stations with a capacity of 258,000 horsepower. Some of these compressors are used exclusively for handling storage gas. To cope with a daily and seasonal fluctuating demand for gas, Columbia stores gas in 38 underground reservoirs, rock structures from which original gas has been taken and into which pipe line gas is held under pressure.

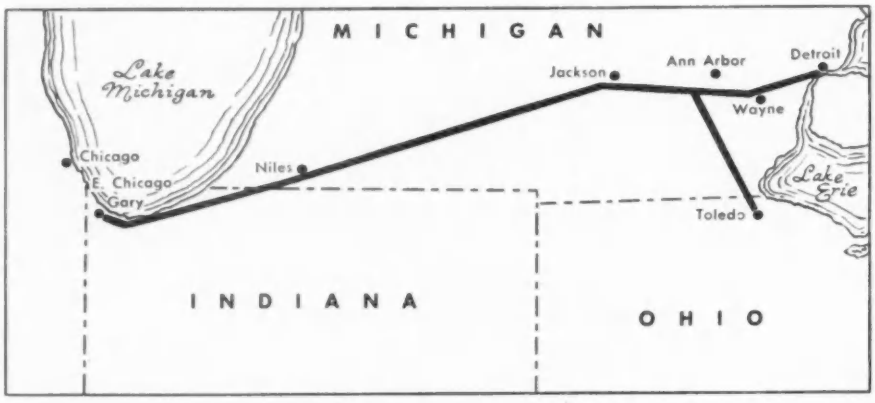
Storage Increased. Storage plays such a vital role in the system's operations that Columbia is constantly increasing the capacity of its existing underground storage areas and opening up new reservoirs. The company's gas in storage, which totaled 204 billion cubic feet at the end of 1952, will be increased to 250 billion cubic feet this year. On a peak winter day, Columbia must rely on storage for 50 percent of the gas it sells.

Dispatching offices, where the flow of gas is regulated, are located at Charleston, Columbus and Pittsburgh. Those cities are headquarters for the three main "groups" of Columbia companies.

In addition to 14 operating natural gas companies, the Columbia Gas System includes Preston Oil Company, which produces oil. Preston and certain of the utility companies market gasoline extracted from natural gas. Preston operates 1500 wells with a daily average production of about 1600 barrels.

WHAT'S HAPPENING
IN PIPE LINE CONSTRUCTION

By **THERESA K. MARTIN,** WORLD OIL Staff



ROUTE OF WOLVERINE'S new 16-inch products pipe line.

Wolverine Awards Contracts

The Wolverine Pipe Line Company is laying a 16-inch, 200-mile line from East Chicago, Ind., to Detroit, Mich., with a lateral extending south to Toledo, Ohio. The company is sponsored by Shell Oil Company, Cities Service Oil Company, and The Texas Company. Shell is designing the $15 million line and will supervise construction.

Contract has been awarded Midwestern Constructors, Inc., of Tulsa, Okla., for the construction of 153 miles from the east side of the Kalamazoo River westward to Kennedy Pump Station at East Chicago, Ind. H. C. Price Company of Bartlesville, Okla., has the coating contract for approximately 50 miles of line. In addition the Price Company will apply a concrete jacket to 5.3 miles of pipe. Mastic coating will be used on sections of the line through the heavily congested areas of East Chicago and Gary, Ind., and across the swamps in lower Michigan.

The initial flow is expected to be 95,000 barrels per day with an eventual capacity of 170,000 bpd. PAD has approved allocation of pipe for the second and third quarters of this year, and it is planned to have the line ready for operations by December 1st.

Lines to Carry Williston Basin Production Advancing

Products Pipe Line Company, a wholly owned subsidiary of the Standard Oil Company (Indiana) has started trenching for its 207-mile, 10-inch line from Mandan, N. D., to Moorehead, Minn., where it will tie into the products line from Whiting, Ind.

Service Pipe Line Company reports 9.6 miles of 16-inch pipe strung on the 154-mile crude line from Tioga, N. D., to Standard's (Indiana) refinery yard where a 30,000 barrel-per-day refinery is under construction. When weather permits, the 60-mile, 12-inch line from Tioga to the Missouri river will be rushed, and the 94 miles of 16-inch to Mandan pushed.

Signal Oil and Gas Company and Amerada Petroleum Corporation are also making fairly good time on the gathering system from the Tioga and Beaver Lodge Pools to the gasoline plant one mile east of Tioga.

The Texas Company is making a survey for a gathering system that would be tied into a tank farm at Glendive on the Northern Pacific railroad. Texaco has effected a tariff arrangement by which part of its Glendive area production is trucked to Glendive or Frannie, then by rail to Ohio Oil Company that moves it to the Platte Pipe Line Company and from Wood River, Ill., goes through the Basin Pipe Line Company to Lockport, Ill., refinery.

Shell Oil Company is reported making a survey to care for its Little Beaver, Cabin Creek, Pine Unit and adjacent discoveries. Present shipments go to Martinez, Calif., via truck, rail and tank steamer.

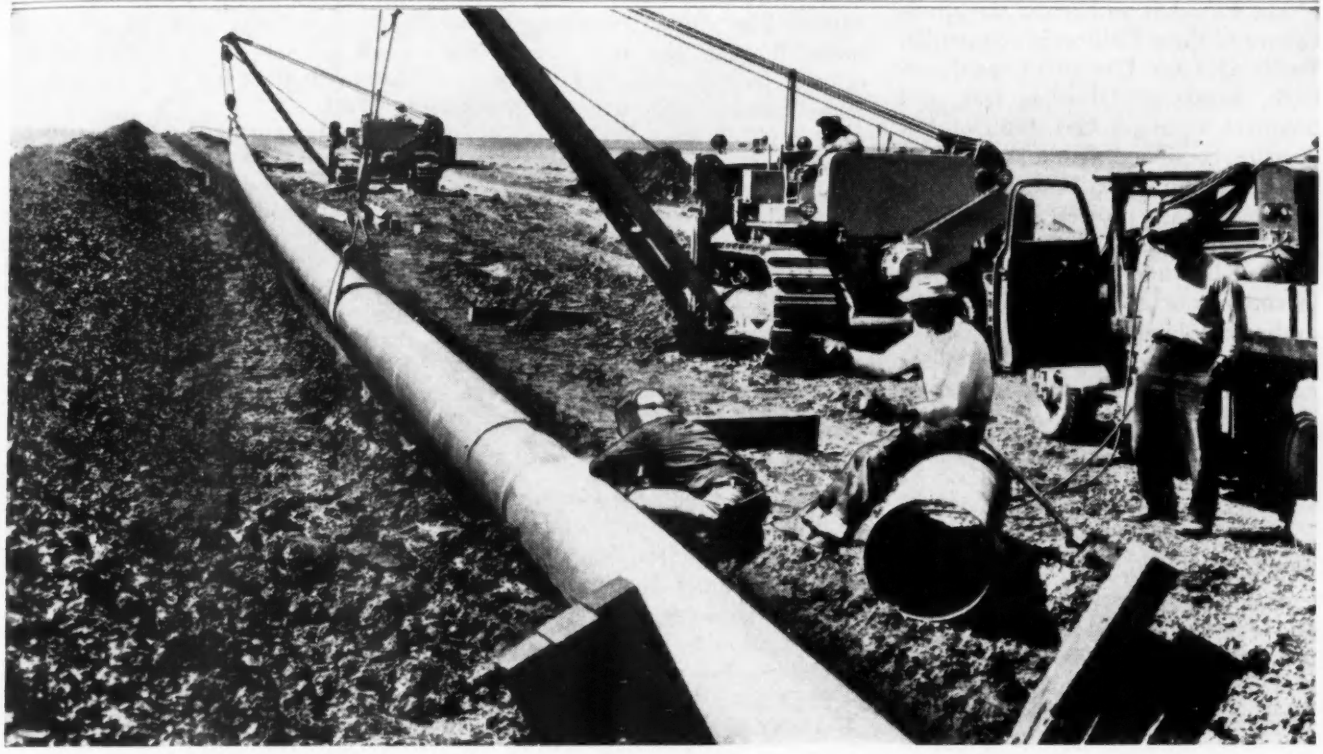
Continental Oil Company and Carter Oil Company, both operating modern refineries at Billings, Mont., are negotiating with W. Turner Clark, independent marketer at Spokane, Wash., to lay at once a 600-mile, eight-inch products pipe line from Billings to Spokane. Originally a 50-50 project, it is now a 40-40-20 affair, and Union Oil Company of California is reported seeking a 10 percent interest. Ultimate capacity of the line will be 25,000 barrels of oil products daily with pump stations at Bozeman, Helena, Missoula, in Montana, and one near Coeur d'Alene, Idaho.

Canadian Oil Joins Sun In Pipe Line Project

Sun-Canadian Pipe Line Co., Ltd., has been formed to build and operate the eight-inch, 200-mile products pipe line from Sarnia to Toronto, which was originally planned by Sun. The pipe line will be jointly owned, ⅔ by Sun Oil Company, Ltd., and ⅓ by Canadian Oil Companies, Ltd., with headquarters in London, Ontario.

Contract for construction was awarded to Williams Bros. Construction has been started, with completion scheduled for October 1 when Sun's new Sarnia refinery is to be completed. Canadian Oil Companies' refinery is also located at Sarnia. Each company has bulk plants at three points along the line—London, Hamilton and Toronto. A seven-mile spur under Lake Ontario will connect lake marine terminals at Hamilton. The line will provide a year-round outlet at Hamilton, London and Toronto and eliminates dependence upon Great Lakes transportation which becomes ice-bound in winter.

PIPE LINE PROGRESS



A string of A. O. Smith line pipe on location during construction of the Interprovincial-Lakehead pipe line.

24-inch looping project to increase Interprovincial pipe line crude capacity

About 135 miles of 24-inch A. O. Smith line pipe is currently being lowered in to loop Saskatchewan and Manitoba section of 16-inch pipe in the Interprovincial Pipe Line. This will add capacity to a transmission system which, by December, will carry western Canadian crudes from the Edmonton, Alberta, area to Sarnia, Ontario.

Upon completion, this will be the world's longest crude oil pipe line, totaling 1738 miles from Redwater to Sarnia.

All the 20-inch and 18-inch pipe in the original line, presently terminating at Superior, Wisconsin, is A. O. Smith pipe. The 20-inch main runs from Edmonton to Regina; the 18-inch completes the run from Gretna, Manitoba . . . just north of the U. S. boundary . . . to Superior.

The present 24-inch installations are part of extensive looping of the 16-inch sector joining the 20 and 18-inch section.

Shipments were made from both Milwaukee and Houston mills, in supplying Interprovincial. A. O. Smith takes pride in its ability to meet delivery schedules, anywhere on this continent, with its high quality, internally expanded, welded line pipe.

A. O. Smith Line Pipe is available in a complete range of sizes and wall thicknesses, from 8⅝-in. to 36-in. diameters.

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DEPENDABILITY THROUGH RESEARCH AND ENGINEERING

Three Applications Combined With El Paso Given FPC O.K.

The FPC has authorized the applications of three California companies, Pacific Gas and Electric of San Francisco, Southern California Gas, and Southern Counties Gas, both of Los Angeles, combined with a proposal by El Paso Natural Gas Company.

The El Paso project, estimated to cost $179.7 million, includes 1792 miles of line and 161,860 horsepower in compressor capacity. These newly authorized facilities will permit delivery of an additional 300 million cubic feet daily to the California companies. The FPC order provides that any time one of these California customers takes less than the authorized amount, El Paso could increase the amount to be delivered to the other customer.

The authorization given Pacific Gas and Electric is for the "alternative project" which entails less construction cost than the original plans. The two Los Angeles companies will spend $7.5 million to construct facilities to transport the additional gas to be received from El Paso.

Interstate Will Have New Shreveport Station

The last part of Interstate Oil Pipe Line Company's modernization and expansion program for the company's Shreveport-Baton Rouge trunk line system will be the construction of a modern crude oil pipe line pump station to be located eight miles south of Shreveport. The station will be named Finney Station in honor of W. R. "Cap" Finney, Interstate's first president.

Finney Station will be equipped with three centrifugal pumps each driven by a 1500 horsepower electric motor, giving the station a total installation of 4500 hp. A design feature of the station is that the pumps and motors will be out doors, weatherproof type equipment being used to make this possible. Much of the station's normal operation will be handled by remote control from the panel board in the office.

As the key station of the Shreveport-Baton Rouge system, Finney will receive oil from two directions, in addition to tank truck receipts. One incoming line, an 18-inch line now under construction, reaches to the Louisiana-Texas state line and will handle Texas-produced crude. The other, a 12-inch line, serves producing areas of northwest Louisiana and south Arkansas. The outgoing stream will move through the new trunk line system consisting of 135 miles of 22-inch, 32 miles of 20-inch, and 33 miles of dual 12-inch pipe. Completion of these projects will mean the retirement of the former Shreveport-Baton Rouge system.

The new line will have a daily capacity of 133,000 barrels. Provision has been made for additional capacity up to 157,000 bpd should the need arise.

North Texas Crude Line Planned by Magnolia

Magnolia Pipe Line Company will build 154 miles of new 16-inch pipe line from Ringgold, Texas, in northwest Montague County to Corsicana, and an all-electric main pipe line pump station at Ringgold.

The new line will replace a multiple eight-inch line system and pumping equipment now in service and will carry crude oil from North Texas and Oklahoma oil producing areas. The 16-inch line will be the first large diameter pipe line laid by Magnolia since 1948 when the Dallas company completed its 647-mile, 20-inch line from Corsicana to Patoka, Ill.

Capacity of the line will be 80,000 barrels per day which can be increased to 113,000 bpd with the addition of one intermediate station if the need arises. The project is scheduled for completion by Jan. 1, 1954.

Canadian Natural Gas Line Completed in Record Time

Construction of the 101-mile, 10-inch natural gas line for Saskatchewan Power Corporation, Ltd., was completed on July 6, only forty-one working days after operations began in Brock. The line runs from the Brock-Coleville area near the Alberta border to Saskatoon, Saskatchewan.

The Banister Construction Company of Edmonton handled the laying of the main line, while the distribution system in the city of Saskatoon is being built by Williams Brothers Corporation. Preston-Clarke Limited of Moose Jaw are constructing the gathering system in the Brock gas fields, as well as the distribution systems for Rosetown and Delisle.

New England Market Fight May Be Settled Shortly

Northeastern Gas Transmission Company and Algonquin Gas Transmission Company have reached an agreement that will likely receive quick blessing from FPC ending a three-year fight for New England gas markets.

The agreement is contingent upon Tennessee Gas Transmission Company, owner of Northeastern, receiving FPC approval to expand into Canada and northern New York state and to run a new pipe line from South Louisiana to Portland, Tenn. Algonquin would get nearly all the markets it was originally granted by FPC in 1951, and Texas Eastern Transmission Corp. would be authorized to sell gas to Algonquin.

Construction of Algonquin's system was started in 1951 following FPC approval to build a line to serve Connecticut, Massachusetts, Rhode Island and New Jersey markets. On appeal by Northeastern, the order was set aside by the U. S. Court of Appeals on grounds that FPC had failed to hear Northeastern's request for expansion into the same market area.

Meanwhile, Algonquin gambled on receiving a permit for the line and continued construction. Today, its system is virtually complete, lying inert for want of legal authorization.

Because of the proposed settlement, FPC had postponed oral arguments set for July 9 to July 17.

FPC approval of TGT's dockets will carry a license to export gas into Canada via Niagara Transmission Company to serve the Toronto area.

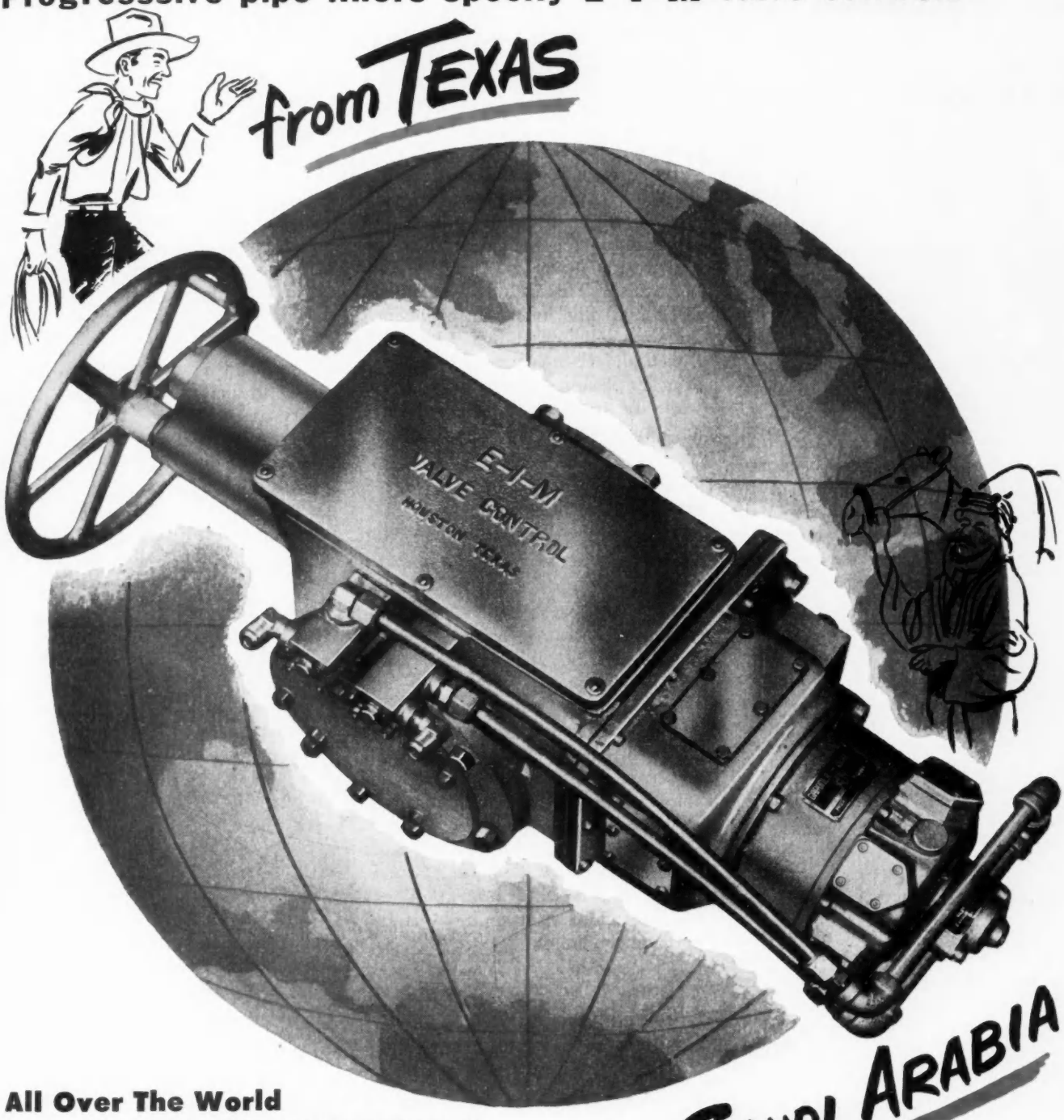
Salt Lake Pipe Line Plans Expansion on Pasco Line

Salt Lake Pipe Line Company plans an expansion program providing for a 20 percent increase in the capacity of the 566-mile products line from Salt Lake City to Pasco, Wash.

The project will include a new pump station at Huntington, Ore., additional pumps at the existing stations at Juniper, Idaho, and Baker, Ore., 40 miles of additional six-inch line between Adams, Ore., and Pasco, Wash., and five 12,500-barrel tanks at Boise, Idaho.

Construction of the facilities will start in the near future and when completed the line will have a capacity of 42,500 barrels per day from Salt Lake City to Boise, and 22,500 bpd from Boise to Pasco. The expansion is necessary to handle increased shipments from the Salt Lake City area. Cost is estimated at $1.7 million.

Progresssive pipe liners specify E-I-M valve controls



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United's Pipe Line in Gulf Now Receives Gas From Sunray

Sunray Oil Corporation has started gas deliveries to consumer pipe lines from the Mustang Island and Red Fish Bay fields in Nueces County, Texas. The two fields, which lie about three miles south-southeast of Aransas Pass and extend about ten miles south in shallow inland bay waters, have been divided into four units where low temperature extraction equipment is being installed to gather gas and distillate from the fields.

The first LTX unit is delivering about 8 million cubic feet of gas daily to United Gas Pipe Line Company. Previous to the construction of the present gas gathering facilities in the two fields and the start of delivery for commercial use, there were 28 shut-in gas-distillate wells in the area. Some of the wells have been shut in as long as 2½ years.

The 36-mile, 16-inch, United Gas Pipe Line Company line has a capacity of 130 million cubic feet of natural gas daily from the new bay source. The line extends from a meter station near Ingleside to a connection with United's system near Refugio, Texas.

H. C. Price Company Gets Large Contract

One of the pipe line industry's largest coating contracts has been signed by Sinclair Pipe Line Company of Independence, Kans., and H. C. Price Company of Bartlesville, Okla., calling for the mastic coating of 104 miles of Sinclair's new Harbor Products System.

The Harbor System, a joint project of Sinclair, Gulf Refining Company and The Texas Company, is designed to carry petroleum products from the Philadelphia area to the New York Harbor area. The three companies will jointly operate a 77-mile, 16-inch line paralleling the New Jersey Turnpike from Woodbury Junction, east of Philadelphia, to delivery points west of New York City. In addition, both Sinclair and Gulf will use mastic-coated pipe to connect existing lines and new tankerage to the new joint line.

The coating project, which already is under way, is being handled by H. C. Price Company at its permanent mastic plant on the outskirts of Philadelphia, and calls for the application of mastic to the following amounts of pipe: 15 miles of eight-inch, nine miles of 12-inch, two miles of 24-inch, and 77½ miles of 16-inch.

In addition to the mastic coating, the Price company will apply a weight coat to the pipe being installed at crossings of the Delaware, Rahway and Raritan Rivers on the new Harbor System. This includes one mile of eight-inch pipe, one mile of 12-inch and one mile of 16-inch pipe. The 8-inch and 12-inch pipe will be given a jacket of concrete 1½ inches thick, while the 16-inch river pipe will have an application 2⅛ inches thick.

Great Lakes Pipe Line Plans System Extension

Great Lakes Pipe Line Company plans extension of its refined petroleum products carrier system to Grand Island, Neb., approximately 125 miles west of Omaha, where a delivery terminal will be constructed.

Size of the line and terminal's capacity have not been decided, but the company said that work will commence as soon as materials are available and that the new terminal probably will be in operation late this fall.

Great Lakes currently transports products from Oklahoma and Kansas refineries through its lines to 14 delivery terminals in seven midwest and northcentral states.

Ohio Fuel Gas Starts Cushion Gas Development

Ohio Fuel Gas Company's completion of a $522,720 gas line project in the Mansfield, Ohio, district is the beginning of the development of a storage reservoir, from which gas eventually can be withdrawn and delivered to consumers. The new line will have a capacity for storing two billion cubic feet of out-of-state gas during the summer months. Little of that gas, called "cushion gas" will be available for use next winter. It will build up pressure in the depleted reservoir. The development program requires two years.

Ohio Fuel Gas, which had 1 billion cubic feet of gas stored in 1936, now has more than 87 billion cubic feet of gas in underground reservoirs.

Colorado Interstate Allowed FPC Shortened Procedure

The FPC ordered intermediate decision procedure omitted on an application by Colorado Interstate Gas Company, of Colorado Springs, Colo. The case will be decided directly by the commission without the filing of an intermediate decision by the presiding examiner who conducted hearings on the application.

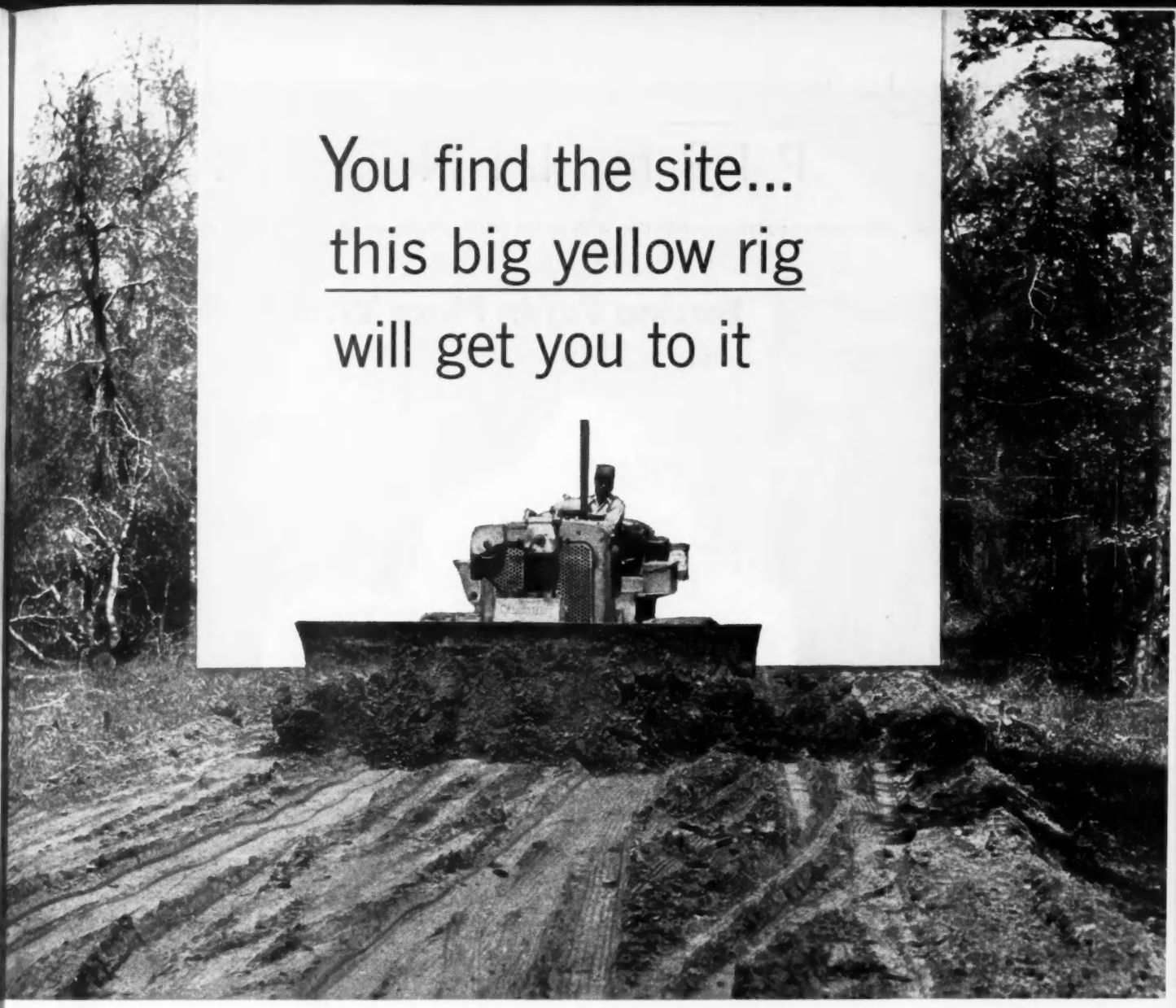
Colorado Interstate proposes to construct 116 miles of pipe line in Colorado, Oklahoma, Texas, and Kansas, and a total of 22,240 horsepower in main line compressor capacity at new and existing stations. The project will increase the sales capacity of its transmission system initially by 82.5 million cubic feet of gas per day to help meet the rapidly increasing demands of resale customers and industrial establishments. Cost of construction is estimated at $19.8 million.

West Coast Pipe Line Seeks To Buy State Royalty Crude

Exchange Oil Purchasing Corporation, subsidiary of West Coast Pipe Line Company, made application to Texas land commissioner Bascom Giles to buy all state royalty crude in West Texas for shipment to the west coast through proposed new pipe line.

Bert Clardy and Alvin Lane of Dallas presented proposal to Texas School Land Board and will include University of Texas Board of Regents. These two state agencies have about 15,000 barrels per day of oil in West Texas through royalty agreements.

Clardy and Lane said their companies would pay $2500 cash bonus for two-year option to buy all state-owned royalty crude in West Texas, and would pay 2 percent over market price for all oil taken. Bonus alone would bring state over $182,000 annually, they said. Clardy said the new line would give outlet for surplus oil in West Texas whose market is allegedly being lost to imported crude. He explained that West Coast Pipe Line Company plans to spend $100 million building from Midland, Texas, to Norwalk, Calif., (in Los Angeles Basin) a 960-mile line of 24- and 26-inch pipe. It would carry 300,000 bpd of crude. Clardy said company has pipe line permit and has bought steel.



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How to do it

PIPE LINE HINTS

$10 is paid for each illustrated acceptable contribution. Mail to The Editor, WORLD OIL, P. O. Box 2608, Houston 1, Texas.

Racking Wrenches

Make a rack for wrenches by tack welding hex nuts to a piece of floor plate. Size the plate according to the number of wrenches to be stored on it. Mount it on an angle iron frame that lets the plate tilt slightly to the rear. This will keep the wrenches from falling off the hex nuts.

The hex nuts should be tack welded on the inside, positioned on the plate in graduated order. Then tack short rods of quarter-inch welding rod to the plate to hold the wrenches straight.

Storing Equipment

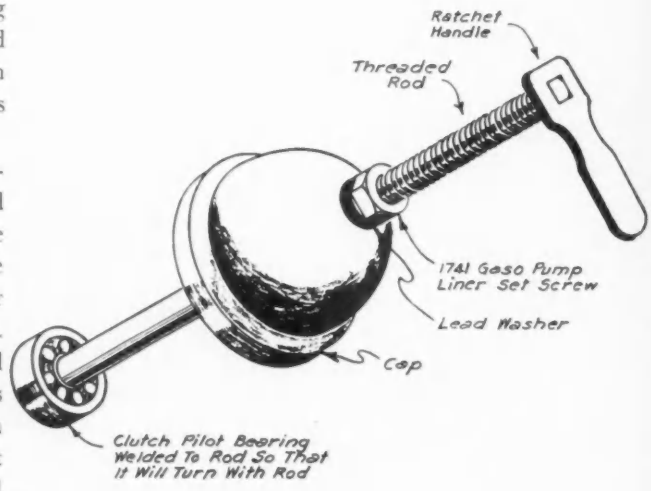
Use this rack for storing nearly all of the small equipment necessary for pipe line maintenance. It provides a space for storing tool boxes and hand tools of individual crewmen and the top of the rack is a boat rack for the row boat that is standard equipment for pipe line crews in areas of river crossings.

Short pup joints of various sized pipe welded to sides of the rack make an ideal place to keep line-up clamps when they are not in use.

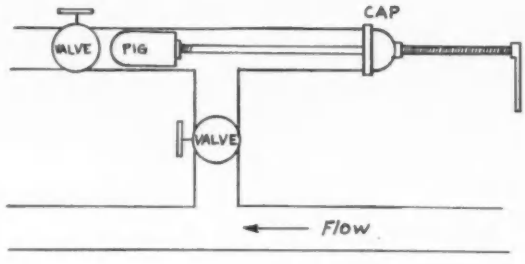
The rack is of simple construction.

Forcing Pig in Place With Jack

Here is a jack that can force a pig in place and hold it there until high pressure oil launches it down the line.

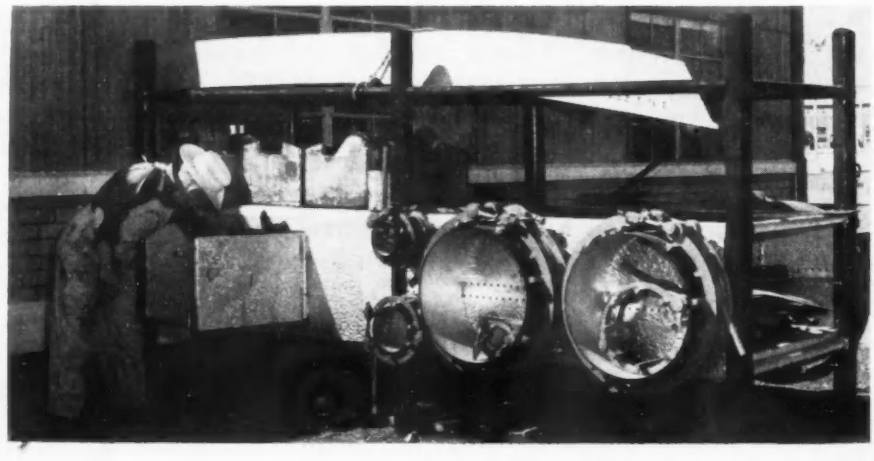

Ratchet Handle
Threaded Rod
1741 Gaso Pump Liner Set Screw
Lead Washer
Cap
Clutch Pilot Bearing Welded To Rod So That It Will Turn With Rod

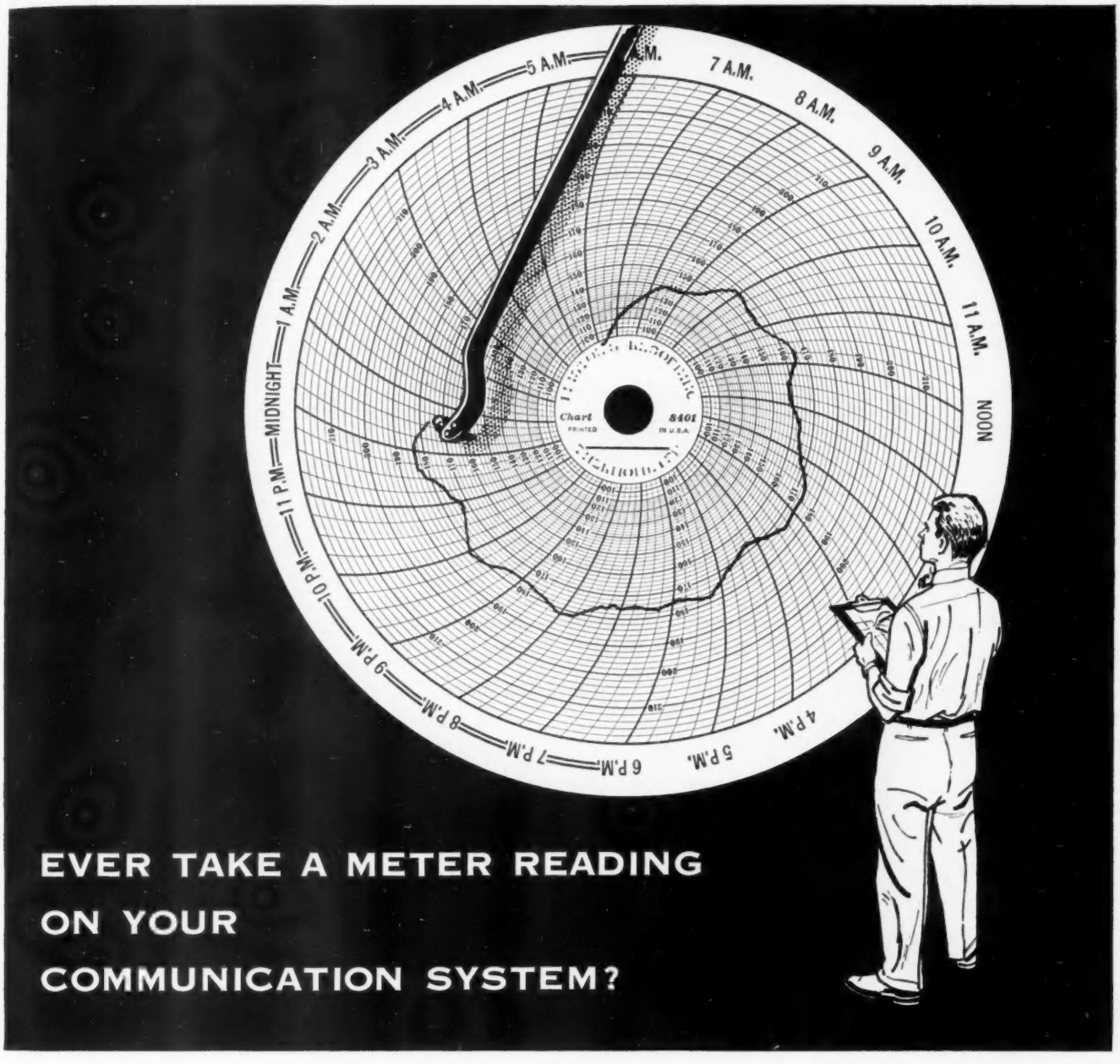
To make this assembly, bore and tap a one-inch hole in the center of the cap on scraper launching trap. Screw a threaded rod through this hole and attach an old clutch pilot bearing to the end of the rod. This presses against the scraper.



The outside seal can be made from an old pump liner set screw and lead washer. Shape the end of the rod so that a ratched handle can be attached. Use this to work the rod into the trap and thus push the scraper into position.

For small diameter pipe lines, this device can be shop fabricated for about $12. It more than pays for itself in the time it saves in inserting scraper.





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Aiding in the completion of this gigantic project is the dependable delivery of Basalt-Kaiser pipe from California.

This is one more example of Kaiser Steel's dependability—one more reason why experienced pipe line companies know that . . .

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Type	Diameter	Length	Wall Thickness	Shipping Point
Continuous Weld—Threaded and Coupled	½" to 4" nominal I.D.	Uniform 21'	Standard	Fontana, Calif.
Continuous Weld—Plain End	2⅜" to 4½" O.D.	Up to 40'	Standard	Fontana, Calif.
Electric Resistance and Fusion Weld—Plain End	14" to 18" O.D.	Up to 40'	.250" to .500"	Napa, Calif.—Basalt-Kaiser
Electric Resistance Weld—Plain End	5⅛" to 12¾" O.D.	Up to 55'	.188" to .375"	Fontana, Calif.
Electric Fusion Weld—Expanded—Plain End	20" to 30" O.D.	Up to 40'	.250" to .500"	Napa, Calif.—Basalt-Kaiser

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Six upright pipe stanchions are set in concrete, and connected with a framework of two-inch pipe. The cabinets and shelves are made of scrap steel plate.

Finishing Ditch

To prevent clods of dirt from falling back into the ditch, one contractor uses a pipe frame which drags along behind the ditcher and smooths off the shoulders of the ditch.

Made from used junk pipe material, it is simply a frame made up of two-inch pipe which hangs down and follows the contour of the ditch. On the sides of the frame are welded wings made up of three-inch pipe set at a 30 degree angle and braced with two more pieces of two-inch pipe to hold the wings of the frame rigid. After the device is placed behind the ditching machine, no further attention is necessary.

Carrying Tools on Cart

Carry everything from scoops to nuts on this handy cart mounted on metal casters. Weld the four casters to a base made of ⅜-inch steel plate. Make partitions and edging for the base out of 1½-inch angle iron. The main supports and crossbars are of scrap two-inch pipe. Make braces from ⅜-inch pipe which also serve

FAST—
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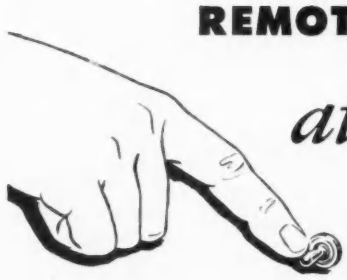
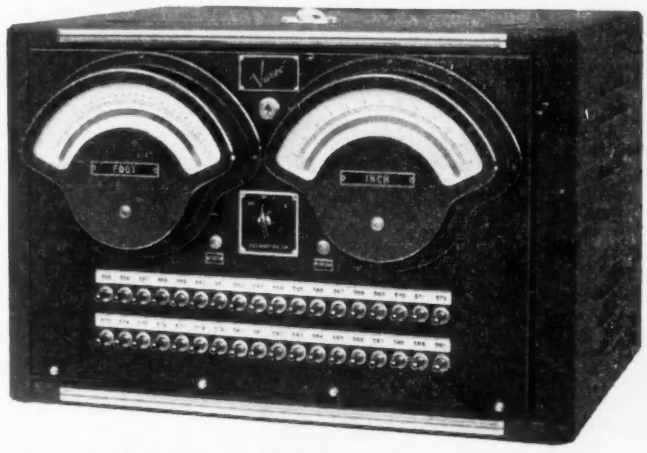


at the flick of a switch!...

FIGURE NO. 9200-R KEY SWITCH TYPE



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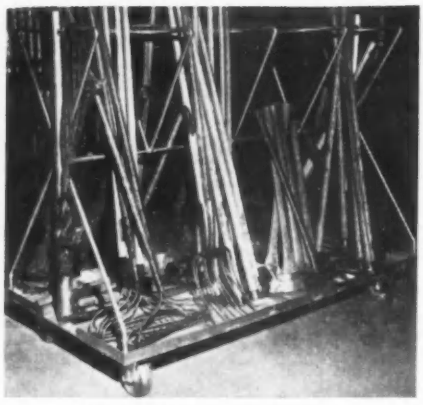
HINTS . . .



as partitions between the rakes and axes and other tools.

Wrapping and Laying Pipe in Ditch

Save one operation in pipe laying by lowering the pipe directly into the ditch after wrapping instead of laying it back onto skids from which it has to be again raised and lowered into the ditch. This also prevents damage to the pipe wrapping by laying it on skids.

In operation, pick the pipe up from the skids on which it is laid for welding and cradle it for the cleaning and priming machine. Before it ever reaches the skids again, dope and wrap the pipe and gently lower it into the ditch. Just behind the wrapping machine, run a holiday detector and any holidays can be quickly patched as the pipe is lowered into the ditch.

This operation is limited to areas where the bottom of the ditch is soft and free of rocks that could bite into the warm coating. Generally speaking, the operation is most successful on 16-inch and smaller pipe.

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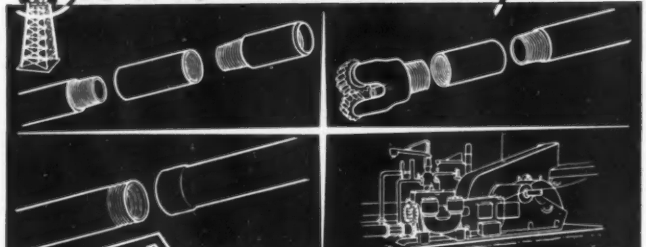
All around the rig.....



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JOHN CRANE CRANE PACKING COMPANY

The Big Payoff

Aminoil Neutral Zone wildcat succeeds after five others failed.

AMERICAN INDEPENDENT Oil Company's oil discovery in the Neutral Zone between Kuwait and Saudi Arabia early this year provides another link in the extensive chain of proved Middle East oil fields. The discovery offers an indication to a broader expanse of Kuwait's prolific Burgan field, the southernmost limits of which lie 18 miles north of the Aminoil wildcat discovery, Wafra 4.

Production tests from the discovery, made by Aminoil operating on behalf of itself and Pacific Western Oil Corporation, came from the initial Burgan sand at a depth of 3470 feet—90 feet shallower than the minimum depth to the top of the first Burgan sand found by most wells in the Kuwait field. The wildcat had penetrated more than 150 feet of this sand before completion which indicates the existence of a thicker and better defined section of the first Burgan sand as found in Kuwait. A drill stem test flowed at a rate of 2400 barrels daily of clean oil.

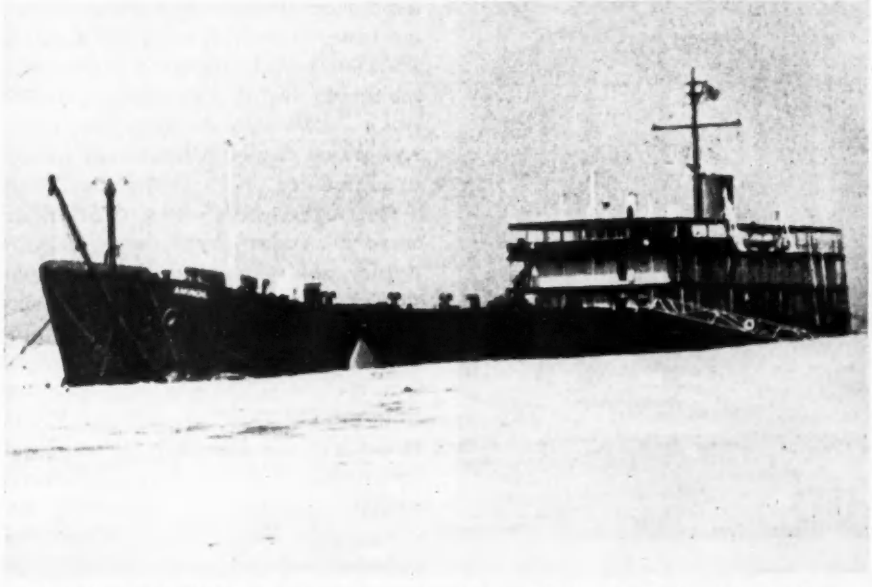
The Wafra discovery is the first in the Middle East made by U. S. companies other than the "Big Five" American companies participating in Bahrain and Saudi Arabia.

Wafra 4 was Aminoil's sixth attempt to find oil in the Neutral Zone. Five previous dry holes had been drilled at a reported expenditure of $30 million.

Aminoil and Pacific Western agreed to divide any oil produced equally. The Aminoil concession, made in 1948 with the sheik of Kuwait for 60 years, provides for a bonus of $7,250,000 plus an annual rental of $625,000 until royalty payments from crude output equal this amount. The sheik was given a 15 percent interest in production. Royalty amounts to 33 cents per barrel plus a cent a barrel tax.—**The End.**

WAFRA 4 DRILLING RIG. This was Aminoil's sixth attempt in the Neutral Zone.

OIL WAS COLLECTED in this ditch during tests on Aminoil's successful wildcat.



CONVERTED LST served as camp and warehouse for operations in Neutral Zone.

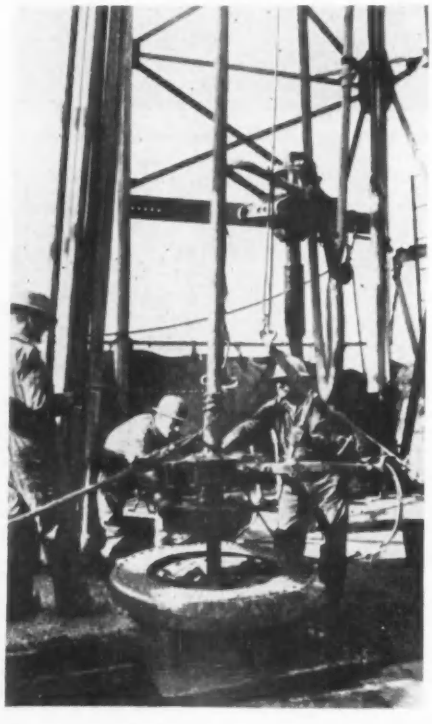
HEADQUARTERS of Eakring field.

Kingdoms of Oil—No. 17

Nottinghamshire County

This English community shed its serenity once—and joined the ranks of oildom's boom towns.

By J. CUMMINGS



DRILL PIPE being pulled on Nottinghamshire field well.

NOTTINGHAMSHIRE COUNTY, tucked quietly away in England's midlands, is a "silk stocking" oil region which owes its stature about as much to hosiery as to oil.

Residents who found in 1939 that they were living above reservoirs of petroleum were as surprised then as the Danes who quartered in Nottinghamshire during the winter of 868 would have been to learn the region would one day be a hosiery manufacturing center.

Nottinghamshire's first view of oil came in August, 1939, when D'Arcy Exploration Company, Ltd., a subsidiary of Anglo-Iranian Oil Company, brushed aside poignant, misty pages of history to discover oil. The first well—at Eakring and not far from the Sherwood forest where Robin Hood and his legendary friends and foes frolicked and fought—punctured a shale and sandstone structure between 1868 and 2643 feet deep. And found initial production of 365 barrels a day!

As oil field language flowed for the first time in the old oak-beamed Queens Head tavern, where crewmen quaffed tankards of ale and threw darts for entertainment, a chain reaction was set off at Eakring village, near the first wildcat.

Boom Town. Officials, newspapermen and oil boom queues quickly appeared; Eakring village blossomed at night with drilling rig-generated electricity; farm laborers forsook wheat fields for higher oil company wages; living standards jumped as wives and daughters found work at drill site canteens; pipe lines were strung across three miles of wheat fields to Billthorp rail junction, where 23 rail tank wagons were filled daily; the tempo of rural life succumbed to the oil boom urgency which descended on the village like a London fog.

This urgency was intensified even further when, hard on the heels of the Eakring discovery, came news that a small quantity of oil was found in

PUMPING WELL at Nottinghamshire.

the carboniferous limestone at Kelham, a few miles from Eakring.

And while drilling proceeded at Eakring and Kelham, commercially important quantities of crude were discovered at Duke's Wood and Caunton, south and east, respectively, of Eakring.

These developments came at a time when every available barrel of crude was precious to an oil-short country at war.

Field development proceeded rapidly. During the initial stages, elaborate and cumbersome equipment was used. Shortly after the discoveries, modern U. S. equipment replaced old rigs, and drilling was accelerated.

While the discovery of oil etched itself deeply into the life of rural Nottinghamshire, austere British tradition held to a minimum any changes in the appearance of the county's villages astride the oil fields. Save for pumping units which hover above the holes.

Changes Rejected. Contrasted with the quick-development pattern usually left in the wake of oil booms, Nottinghamshire towns remained drab. But that was countered by historical ebbs and flows each of which left its imprint.

Caunton was built 700 years before a drill bit chewed its way into oil. A village of red brick houses and a small gray church, it is poet Alfred Lord Tennyson's "Rose King." Duke's Wood, a spacious area of deer parks, woodlands, gardens and lakes, is the site of Welbeck Abbey, a remnant of the 12th century.

Nottingham is a city of more than 300,000 inhabitants, most of whom work in great industrial plants. It boasts a prehistoric past, and residents point to chambers, holes and caves hewn out of the soft sandstone rock as the homes of ancient Britons who lived there before Romans invaded Britain.

With this historic past to soften the sometimes harsh progress usually wrought by the discovery of oil, Nottinghamshire County soon reverted to its former serenity.

But the residents momentarily glimpsed the importance of oil, and today hold in a tight grasp the memories of the dizzy, jolting, titillating experience of an oil boom.

The Queens Head no longer rings with the raucous laughter of hardy drillers, toolpushers and crewmen. The men who search for oil have gone. But the men who watched them have not. They still remember.

For they belong to the pungent history of oil. They lived in a boom town.

JACKKNIFE RIG hoisted into position at new Eakring site.

About the Author

J. CUMMINGS, Boldon Drilling & Engineering Company, Ltd., Sunderland, England, is a frequent contributor to British national and provincial newspapers and magazines. He is a native of Sunderland, where he attended St. Aidan's grammar school. Later, he attended Redemptorist College at Liverpool. From 1947 to 1949 he served in the Royal Navy in the Mediterranean area.

What's Happening

AMONG WORLD OIL MEN

Nomads Entertain in Houston . . .

Houston Chapter of Nomads' foreign guests at a recent meeting were, left to right, Pierre de Verteul and J. A. Dahlegren, Jr., Socony-Vacuum Oil Company, Caracas, Venezuela; A. Gorkovoi and H. W. Lafeber, Bataafsche Petroleum Mij., The Hague; Rene Saint-Amans, Fortex, Algeria; J. M. Russell, Shell Petroleum Company, London; F. W. Haeseker, Asiatic Petroleum Company, The Hague; R. L. Holden, The Texas Company, Caracas; and J. C. P. Stoltz, Shell Oil Company, The Hague.

C. STRIBLING SNODGRASS is in Karachi to prepare a report for Pakistan Petroleum Limited on the distribution of gas from Sui, Baluchistan, to other parts of the country. Special emphasis will be placed on bringing gas to Karachi via Sukkur, Rohri and Hiderabad. Pakistan Petroleum will make the report available to the government of Pakistan. Snodgrass was a director of U. S. Petroleum Administration for War's foreign division during World War II. He also has served as consultant to the Brazilian government on fuel problems and advisor to the Saudi Arab government.

C. S. Snodgrass

•

At a recent meeting of the general board of governors of the Canadian Petroleum Association, C. U. DANIELS was elected chairman. Daniels is president and managing director of Royalite Oil Company Limited, and first vice chairman of the board of directors of the Alberta Division of the association.

CHARLES HAY, president and general manager of Hi-Way Refineries Limited, Regina, and chairman of the board of directors of the Saskatchewan Division of the association, was elected first vice chairman.

. . . In Los Angeles

International guests at a recent Los Angeles Nomads Chapter meeting were, standing, left to right, W. K. Wardroper, Canadian consul; E. J. Turner, Arabian American Oil Company, Saudi Arabia; Antonio Correa do Lago, consul of Brazil; Jacques Bodio, SEREPT, Tunisia; W. H. May, Santa Fe Drilling Company, Venezuela; Paul Lossel, SEREPT, Tunisia, and L. S. Dawson, Oil Well Engineering Company, England. Sitting are Antonio Islas, Mexican consulate staff; Sidney E. Faithful, British consul; Miguel Baca, Santa Fe Drilling Company, Peru; Karl B. Jauman, Basrah Petroleum Company, Iraq; Gonzalo Acosta, Empresa Colombian de Petroleos, Colombia.

Charles Hay

C. U. Daniels

A. G. BAILEY, vice president and general manager of Bailey-Selburn Oil and Gas Ltd., Calgary, and chairman of the board of directors of the Alberta Division of the association, was elected second vice chairman.

G. L. HUMPHREYS was appointed secretary-treasurer of the association, and R. H. C. HARRISON, Q. C., continues as president.

•

W. VAN DUSEN, manager of the Standard-Vacuum Oil Company, retired recently after 30 years' service, spent mostly in Bombay, India, and Karachi, Pakistan. He had been manager of the Karachi office since 1949.

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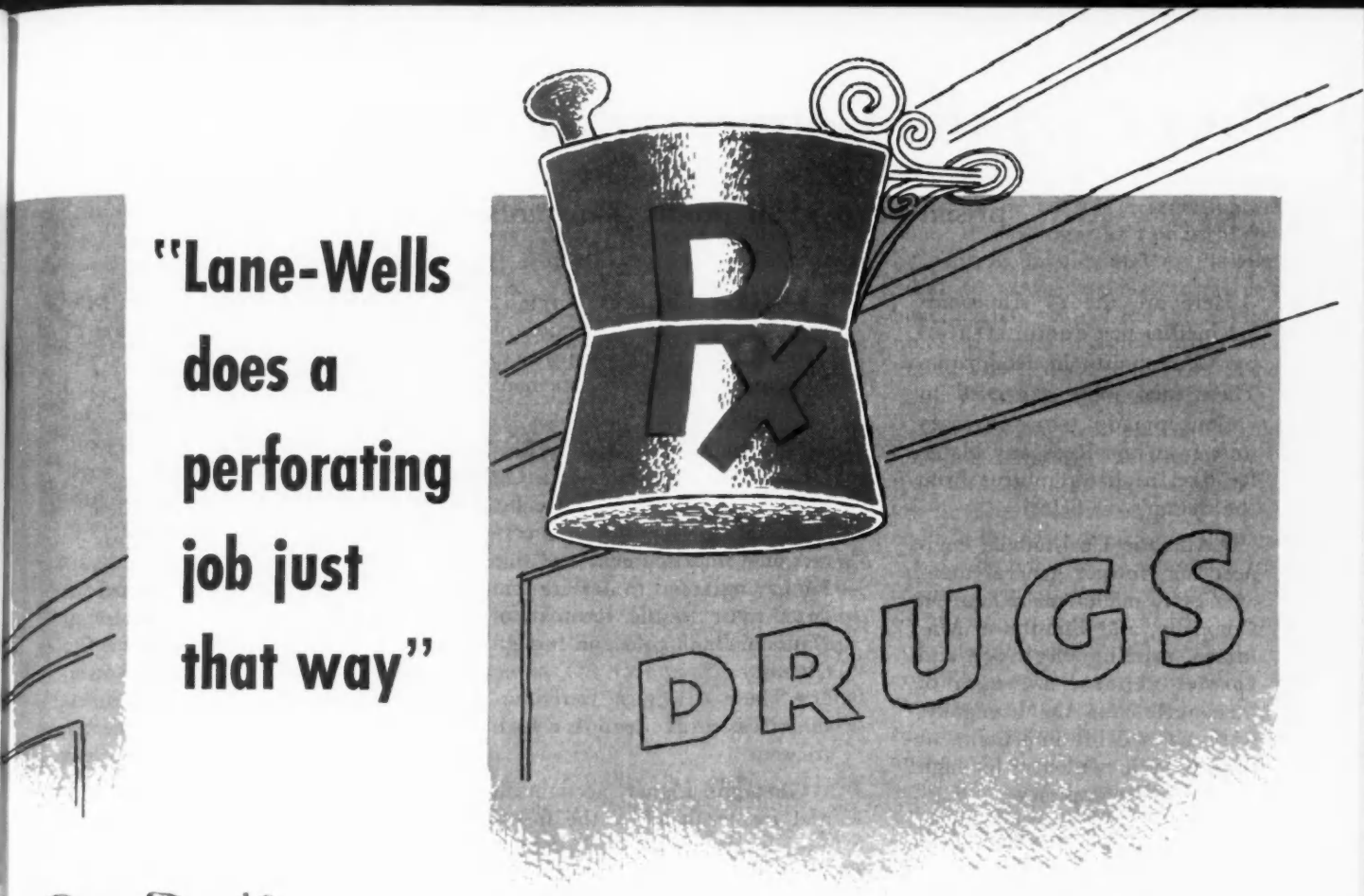

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They Paid the Communists' Price

. . . . prison because oil production quotas weren't met

Here are the 24 scapegoats for inefficiency demonstrated by Communists in Roumania. These men were sentenced to various prison terms so as to shift from the Reds any blame for diminishing returns from the nation's oil fields.

• **Atanasie Christodulo,** engineer and former general manager of Romano-Americana Oil Company, and **Constantin Matasaru,** mining engineer and former general manager of Steaua Romana Oil Company, were assessed life imprisonment plus five-year sentences for high treason and conspiracy.

• **Alexander Alexandrini,** lawyer and former minister of finance; **Petre Petrisor,** former director of Petroleum Delivery Office and former head of the commercial export service of Creditul Minier Company, and **Constantin Capsa,** former head of the personnel office of Astra-Romana Oil Company, were given life terms for high treason.

• **Romeoa Plesoianu,** engineer and former secretary general of the Ministry of Mines and Petroleum and former government commissioner at the Petroleum Delivery Office; and **Constantin Fotescu,** former manager of Romano-Americana Oil Company and former president of the Petroleum Delivery Office administration board, each was assessed 25-year term for complicity in high treason and high treason.

• **Gheorghe Paliuc,** geologist and former head of the geological department of Astra-Romana Oil Company; **Aurel Bente,** technician and former manager of the technical directorate of Astra-Romana Oil Company; and **Ion Solacolu,** lawyer and former general manager of Steaua Romana Oil Company, each was assessed 20-year term for high treason.

• **Mihai Ciupagea,** former head of "formalities" section of Astra-Romana Oil Company, 25 years in solitary confinement for high treason.

• **Heinz Ziwi,** former technician with Astra-Romana Oil Company, 18-year sentence for high treason, five years of correctional imprisonment and fine for having failed to declare and turn over to the Roumanian National Bank gold and foreign currency.

• These oil men were sentenced as indicated for high treason:

Gheorghe Ligner, accountant and former head of the financial department of Romano-Americana Oil Company, 15 years; **Eugen Alexandrescu,** former chemical engineer with Mutenia Petroleum Center, 10 years; and **Grigore Costescu,** former Romano-Americana Oil Company engineer, 12 years.

• These four were assessed five-year terms for high treason.

Alexandru Stroe, former Astra-Romana Oil Company employe; **Nicolae Oprisan,** engineer formerly with Astra-Romana Oil Company and Mutenia Petroleum Center; **Ion P. Sava,** formerly with Astra-Romana Oil Company and Mutenia Petroleum Center; **Dumitru Posta,** accountant; and **Anatol Gobijla,** chemical engineer and former technical subdirector at Office for Petroleum Deliveries.

• **Ion Kisielevshie,** chemical engineer and former director of sales department of Unirea Oil Company and former board member of administration at Office for Petroleum Deliveries, received an eight-year term for high treason, and **Stephan Iordanescu,** formerly with Mutenia Petroleum Center, was given a three-year term for high treason.

• **Cezar Popescu,** former general manager of Distributia Company, former president of Association of Roumanian Oil Manufacturers, and former administration board member of Astra-Romana Oil Company, no punishment reported.

• **Traian Meriou,** former Mutenia Petroleum Center accountant, no punishment reported.

. . . Here's Why

WHAT HAPPENS when Communists take over a nation's oil industry? Why have they failed at every turn to produce satellite fields efficiently? Why is unrest growing among satellites whose oil industries formerly afforded valuable domestic revenues?

Answers to these questions lie in the pattern of Communistic approach which is identical regardless of the industry. Inexpert politburocrats, ever afraid for their own lives, establish unrealistic production quotas. When these quotas are unfulfilled, these same officials resort to purges to cloak their errors and to shift the blame upon technical experts who had no voice in setting quotas.

That pattern has completed the circle in Roumania, where 24 leading Roumanian oil men have been convicted by the Bucharest Territorial Military Tribunal on espionage, sabotage and black marketing charges.

Since the Roumanian oil industry was nationalized under the Soviet-Roumanian Petrol Agency amid wild claims, the fields have deteriorated, production and drilling have decreased greatly. So the oil technicians were charged with the blame.

But no mention was made during the trial about the Soviets dismantling more than $75 million worth of

machinery and field equipment during the fall of 1944!

To cover this Communist failure, these oil men who first served in international oil organizations and who later were employed by the SovRum enterprise were indicted and brought to trial February 9, 1953, at Ploesti. The state prosecutor, Lt. Major of Justice Constantin Caranda, said the accused acted as spies and saboteurs in the interest of American and British intelligence, in the interest of ex-King Michael and of the "bourgeoisie" political parties, "now eliminated."

(It may be remembered, however, that the Soviet and Soviet-inspired satellite practices name all responsible men as "spies" and "saboteurs" who are unable to fullfill the government's quotas on production volume or who are unfortunate enough that projects which they head result in failure.

(Considering the standard practices, it is apparent that, even after the nationalization of the Roumanian oil business, no turn for the better has been experienced, as hoped for by the joint Soviet-Roumanian Petrol Agency.)

The bill of indictment described the alleged crimes thus:

• "American and British imperialists plundered Roumania's riches for decades. Losing this opportunity after establishment of the peoples' power, the defendants initiated and organized acts of espionage, sabotage and diversion against Roumania's Peoples' Republic, the country's national economy and the peoples' interests.

"Four big companies, branches of Anglo-American trusts, were masters until nationalization. These companies were Astra-Romana Oil Company (branch of Royal Dutch/Shell Group), Unirea Oil Company (affiliated with Britain's Phoenix), Steaua Romana Oil Company, in which a British group was interested, and Romano Americana Oil Company, branch of Standard Oil Company (N. J.)

• "Defendants undertook to decrease production and to disorganize national economy with a view toward preventing the progress of the Peoples' Republic's economy and reestablishing capitalism."

• The prosecution claimed that "imperialist trusts sent the leader of former oil companies—Astra-Romana, Steaua Romana, Unirea, and Romano Americana—to organize a vast center of espionage and sabotage. This time they donned the dress of members of the American and British missions in Bucharest."

• "In order to organize an espionage network," read the accusation, "the British appointed in September, 1944, Fritz Gartner as sole manager of the Astra-Romana Oil Company. This man ordered the defendant Constantin Capsa to inform Colonel Foster, of the British Mission's economics department and former Astra-Romana engineer, and Lt. Col. Masterson, former Unirea engineer, and Lt. Col. Galpin, former Steaua Romana Oil Company employe, of all activities of the Astra Romana Company and to supply oil industry data.

"Acting under his orders, Capsa delivered to these three officers data regarding output, drilling, processing of crude, and other information, including financial deals with banking houses, supply of material, etc.

"During this period, the former director of Romano-Americana Oil Company, R. P. Bolton, a director for Europe and the Near East of the Standard Oil group, was sent to Roumania as a member of the U. S. Military Mission. His orders were to establish an espionage ring within the Roumanian oil industry.

"Not before the arrival of Otto Stern, a long-time director of the Astra Romana Company did the espionage become organized. Stern, the representative of Royal Dutch/Shell, is the man who directed the Roumanian prewar oil business behind the scenes.

• "In May of 1945, Stern set up a coordination committee called the 'management committee,' formed by the four managers of the said four companies, and delegates of the American and British Military Missions accredited in Bucharest. The meetings, held either at the headquarters of the Astra-Romana Company, at the home of (the British Colonel Fritz) Gartner, or that of U. S. Colonel Willcox (sic) were attended by several defendants."

Defendant Popescu, one time head of the Association of Oil Manufacturers of Roumania, "admitted" that the goal of the activities "was intended to on the one hand to inform foreign countries in an organized manner about the economic and political condition in Roumania, and, on the other hand, to secure instructions from headquarters abroad for the application of the general plan to bring about mounting difficulties for the democratic regime in Roumania."

The four-day trial ended with defendants claiming all accusations were true and asking to be punished severely. The Communist press further claimed the defendants offered voluntarily all evidence to complete the charges leveled against them beyond the horizon of the bills of indictment.

In the absence of Western observers, all material was received from Communist sources. However, knowledge of Communist practice in trials and pre-trial questioning casts doubt over the alleged statements of the defendants. Altering indictments to suit the prosecution is standard practice beyond the Iron Curtain.

The actions of the sentenced men were in the interest of the respective companies, and oil men in the free part of the old continent know that the 24 executives are the scapegoats for the inefficiency of the Roumanian oil industry—evidenced since nationalization, reports a qualified WORLD OIL source from behind Roumania's Iron Curtain.

Construction in Italy To Be Completed Soon

The "Condor" Societa per Azioni per l'Industria Petrolifera e Chimica of Milan expects to complete the construction of both the Pantano di Rho refinery and the Genoa-Rho pipe line this summer. British firms building the facilities have been delayed in obtaining metal allocations.

The double 16-inch pipe line between the Fegino tank farm and Rho has been completed as well as a pumping station, and pumps are being mounted. The "Condor" Company has contracted with the leading oil groups operating in Italy for the sale of the greatest part of the output of the Pantano di Rho refinery which prevents the necessity of creating an independent distribution system requiring the investment of huge capital.

a WORLD of OIL

- Turkey permits available
- Argentina wildcat success
- Russians reduce prices

By DON KLIEWER, WORLD OIL Staff

Turkey: All qualified oil companies can now obtain geologic exploration authorization upon application even though the new petroleum law now being drafted has not been approved officially. That approval is expected when the law is presented to the Grand National Assembly when it reconvenes November 1.

England: A 136-foot rig is being erected at Screveton, south of Newark, Nottinghamshire, where D'Arcy Exploration Company will drill a wildcat to 3500 feet.

Argentina: A Salta province wildcat drilled by Yacimientos Petroliferos Fiscales, the nation's oil monopoly, has struck oil at 13,400 feet at Madrejones, near Tartagal, near the Bolivian border. The well flowed at a rate of 3144 barrels of crude and 35 Mmcf. of gas per day on test . . . Diadema Argentina (Shell) has scheduled a deep test to about 10,500 feet at the close of 1953. The company now holds the depth record at Comodoro Rivadavia—8400 feet . . . Plans are being worked out for an oil pipe line to the industrial town of Santa Fe from the Madrejones discovery, which is considered more important than the Campo Duran oil wells, 30 miles away, where wells are brought in with a flow rate of about 2200 barrels daily.

Neutral Zone: American Independent Oil Company's second Wafra structure test has encountered an oil sand at 3620 feet. This test is situated about 2¼ miles from the discovery well, Wafra 1, completed in March, and was drilled to test the northwest flank of the structure. The completion of this second test was scheduled in July, when a third test will be spudded-in.

Austria: Van Sickle Company began a well drilling in the south Styrian district of Radkersburg to a scheduled depth of 6600 feet. The area borders the Hungarian Zala oil fields and the gas fields south of the Zala region in Yugoslavian territory. Persbersdorf 1, the newly-drilled well, is the first drilled outside the Soviet Occupation Zone since the end of World War I.

Albania: Russians report that the country will be able to supply its domestic requirements with domestically refined products and will be able to export large amounts to the east upon completion of a new refinery under construction which will have an annual throughput of about 900,000 barrels.

Czechoslovakia: Reports indicate that wells are now being drilled in the Moravian-Slovakian border district south of Brno (Bruenn), in addition to the Slovakian area around Gbely.

East Germany: Drilling operations are under way in the Ludwigslust area where, near Werla village, four rigs have been in operation this year. Seven more rigs will be erected in the immediate future . . . Plans to put the Volkenrode oil field into production still await arrival of Soviet machinery similar to the Uraimash type used in Altmark test drilling in Thuringia province.

Hungary: An extensive exploration program is reportedly under way near Nagy-Kaniza.

Roumania: A new 3½-inch steel pipe for the oil industry has been in quantity production since April. The Malaxa-Tuburi Works is the only firm now making this size of pipe . . . The Urlati school for drillers, in the Ploesti region, graduated its first class of 38 recently after three months' training.

Russia: Retail prices on gasoline, fuel oil, kerosine, and heating oil have been reduced 25 percent. Current gasoline price: about 31 cents a U. S. gallon . . . Reportedly, chemists have developed a new kind of synthetic gasoline which can be produced cheaply. This synthetic gasoline likely comes from the hydrogenation plant erected near Lake of Baikal and for which dismantled parts of German plants were used.

The Netherlands: Traces of crude have been found in a Nederlandse Aardolie Maatschappij well between DeWijk and Koekange, west of Moppel town in Drente province, at a depth of about 7700 feet . . . Prior to this test, NAM had discovered a gas deposit at De Wijk at a somewhat higher level.

Germany: First series of production tests on Gewerkschaft Elwerath's wildcat Eich 3, which found a new natural gas deposit north of Worms, Upper Rhine, have resulted in a daily gas flow of about 882 Mcf. . . . In the newly-discovered Rot oil field, south of Heidelberg, which is owned by the joint interest group Itag-Wintershall, a second well, Rot 4, has been completed at 2132-2296 with a 63-75 barrel a day flow. Rot 4 flows from the same horizon and depth as Rot 3. The new well is situated about a half mile northwest of Rot 3; plans are under way to drill another well. After completion of production tests, Stockstadt 2, the second successful well in Gewerkschaft Elwerath's newly-opened Stockstadt oil field, near Darmstadt, has been yielding 113-125 barrels of crude daily on pump from the Pechelbronn layers . . . Producing limit of the new Boostedt oil field in Middle Holstein, which belongs to Deutsche Vacuum-Dea-Preussag, has been extended about a half mile south by the successful completion of Boostedt 7.

Canada: The Canadian Board of Transport Commissioners has OK'd a Westcoast Transmission Company request for a permit to pipe natural gas to eastern Washington and the interior of British Columbia . . . Alberta's proved, probable and possible gas reserves have been put at 18¾ trillion cubic feet by DeGolyer and MacNaughton of Dallas, Texas, an increase of more than 6 trillion cubic feet in the past two years.

Sicily: D'Arcy Exploration Company, prospecting subsidiary of Anglo-Iranian Oil Company, will drill a test

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well in the Vittoria area, where geological, gravity and seismic surveys have been made . . . Gulf Oil Corporation's two Ragusa province tests have found a gas structure at 1970 feet which is yielding 106 Mcf. of gas daily, mixed with crude oil bubbles. A third well has been scheduled to further evaluate the gas reservoir.

Italy: Through its affiliate, American International Fuel & Petroleum Company, Gulf Oil Corporation has acquired a 50 percent interest in Societa Petrosud, which will explore for oil. The remaining 50 percent is owned by Montecatini, an Italian company. Transferred to the company were oil rights on 405 square miles in Marche area and 432 square miles in Aburzzi area, previously granted by the government to American interests.

Spain: The exploratory well, Marcilla 1, near the town of Marcilla in Navarro Province in Upper Ebro Valley in northeast Spain, reportedly was unsuccessful and abandoned below 11,000. The well was drilled by an American syndicate composed of General American Oil Company of Texas, Delhi Oil Company, Delta Drilling Company, and individuals.

California Price Rise Pleases Alberta Oil Men

The recent jump in crude and product prices in California following removal of price controls in the U. S., is viewed with mixed feelings in Western Canada. It is a help to the oil producer looking for a market in the Pacific States, but it means higher prices for the British Columbia user, at least for the present, since California will provide the bulk of B. C. petroleum demands until the Trans Mountain Oil Pipeline Company line starts delivering Alberta crude next fall.

The hike in California ranges from 10 to 50 cents a barrel on crude, according to gravity. This increase will make Alberta crude more competitive in the big Pacific west coast market once it reaches the export stage this fall. In recent hearings before the Texas Railroad Commission, officials of Standard Oil of California and Socony-Vacuum Oil Company disclosed their company's plans to import Western Canada oil into the Pacific U. S. market.

Manitoba Oil Rights Go With Land, Court Rules

The Manitoba court of appeals has dismissed an appeal which ultimately may affect extensive oil rights in Manitoba.

The appeal was against a lower court decision awarding a lease on oil rights on a farm near Portage la Prairie to Canadian Superior Oil Company of California. The provincial government contended that it owned the oil rights.

The court had ruled that rights went with the land title which changed hands several times before the oil company obtained its lease. The province claimed a reservation on all minerals by provincial statute.

The five appeal court justices were unanimous in dismissing the province's appeal. Counsel indicated the province would seek an appeal to the Supreme Court of Canada.

Western Leaseholds Team Discovers Canada Zone

Western Leaseholds and Martin Mayrath, an American oil operator, have placed their Jenner discovery well, 15 miles northeast of Canada's Princess field, on steady production after it flowed approximately three barrels per hour.

The discovery well perforated the Sunburst sand of the Cretaceous formation at 3119 to 3120 feet with four shots per foot and swabbed 18-gravity oil at about three barrels per hour. A second perforated interval, from 3118 to 3123 feet, was swabbed and flowed at the same rate. A gas-bearing section of the Sunburst which tested, on formation tests, up to 6 million cubic feet per day rate, was left behind the pipe.

The company's second test, one mile to the southeast of the discovery well, also indicates commercial production.

Amerada Pushes Its Sturgeon Lake Oil Hunt

Amerada Petroleum Corporation has staked its third follow-up to its D3 discovery at Sturgeon Lake in the Peace River area of Northwest Alberta.

Amerada will drill its Crown T. F. 44-31 well three-quarters of a mile southwest of the discovery. Amerada has also announced Crown S. F. 33-34, four miles west of the discovery. Meanwhile its Crown R. F. 3-19, 15 miles southeast of the discovery, is drilling past 2589 feet.

Amerada will keep three drilling rigs active in its program to evaluate the first Devonian reef find in the Peace River country. Each Devonian test in the area will mean deep drilling to around 8900 feet or more where the discovery found its 90-foot pay.

German Test Producing 8000 Barrels Per Day

Deutsche Erdoel AG's exploration well Ploen 2, which has opened up a new oil field on the eastern flank of the Boostedt-Warnau salt structure, near Wankendorf (Schleswig-Holstein), is yielding a regular daily flow of almost 8000 barrels. A new test is being drilled 984 feet southwest of Ploen 2.

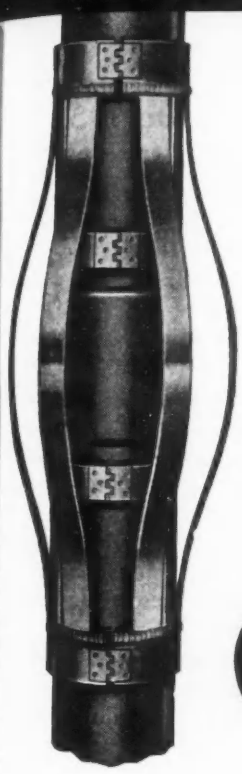
Farther south, in the new oil field of Boostedt, drilling activities by the joint interest group Vacuum-Dea-Preussag are underway. Well B.4, northeast of the successful wells B.1 and B.2a and structurally about 1312 feet lower than B.3, is expected to reach the oil horizon soon. Preparations are being made for a fifth well to be drilled southwest of B.1.

Weser-Ems District Gas Blowout Is Put Out

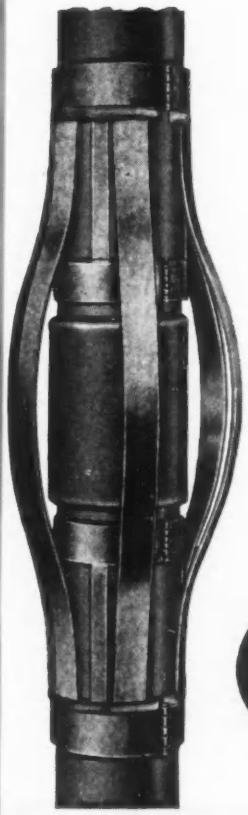
The gas blowout at Gewerkschaft Elwerath wildcat Alfhausen 1, in the Weser-Ems district, has been put out. During the fire, 3400 sacks of cement were pumped into the hole with cementing apparatus borrowed from Deutsche Vacuum Oel AG.

The well is north of Ankum, between Quakenbrueck and the Wiehen mountains. When the gas blowout occurred, the well had reached the White Jura formation at about 2130 feet. When the initial gas traces were noticed in the mud, the blowout preventer was closed. But the gas blew out from behind the casing.

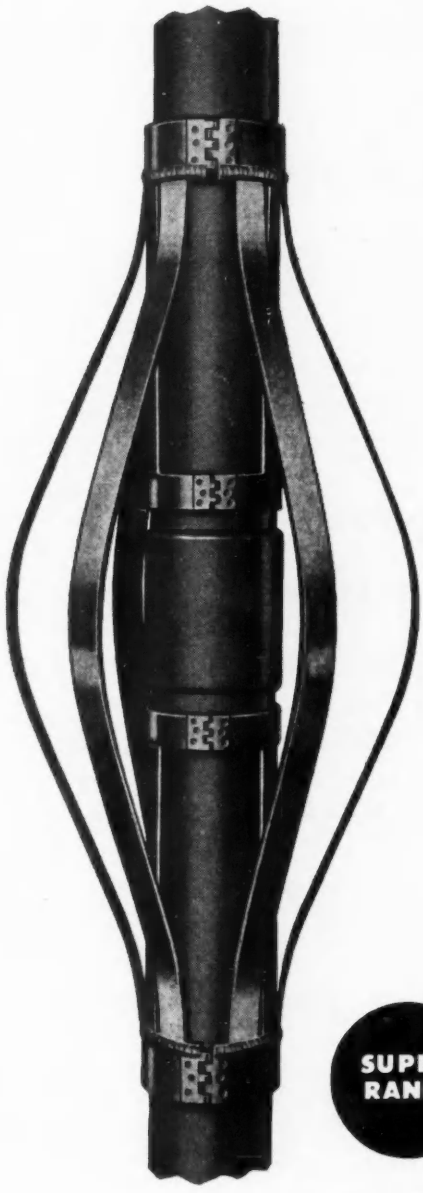
The blowout did establish the existence of natural gas and possibly oil.



20 RANGE



25 RANGE



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Casing Centralizer

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Recommended for GREATER-THAN-NORMAL CLEARANCE—wherever the diametral clearance between the casing ON which the centralizers are mounted, and the casing THROUGH which they are run exceeds five inches, or for NORMAL CLEARANCE where extensive hole irregularities are anticipated. No other centralizer can provide such effective centering action as the "H-50" in *irregular or over-size hole sections, or in cavities.* By increasing the bow of the springs (without proportionately increasing their resistance to starting) maximum centering efficiency is assured, regardless of individual well conditions.

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Baker HINGE-LOK Casing Centralizers are always "pulled" during upward or downward travel of the casing in the well. This feature is important when the centralizer passes through any tight spots in the hole—and is especially advantageous when reciprocating casing during cementing operations.

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Novi Field May Be 1953 Italian Gas Surprise

A well has just been completed at Novi, near Carpi, and should start production shortly. AGIP claims the Novi field will be the Italian gas surprise of 1953.

Halfway between Milan and Venice in the district of Verona, AGIP also claims discovery of a gas structure at a depth of 5500 feet. Wells are being drilled at Chero Carpenedo, south of Fiorenzuloa; at San Pancrazio near Parma; at Pastorello, south of the Comacchio Valley; at Cotignola di Lugo, and one is planned at Castenedolo, near Brescia, as well as at Gaudiano.

A third well is to be drilled in the Marche region at Rapagnano, where the first two wells are yielding from 350 to 420 MCF of gas daily.

Italy Aims for 8.8 Billion Cubic Feet Gas Reserves

According to the Mining Department of the AGIP the aim of the Italian state oil monopoly is to discover gas reserves totaling 8,827,500,000 cubic feet, for only then could Italy be guaranteed independence from the foreign fuel imports. The statement claimed they had reached half that goal.

AGIP has 24 rigs at its disposal, 18 of which belongs to it and six to subcontractors. Four new derricks have been purchased in the U. S.

The first well drilled at Caviaga in 1946 required 300 working days, while at present wells are drilled to a depth of 6500 feet in less than a month.

Italian Government May Extend Monopoly

Italian minister of Industry and Commerce Campilli has confirmed that Ente Nazionale Idrocarburi, which has been given the monopoly of gas and oil research work in the Po Valley, might intervene also in Southern Italy and in Sicily.

This statement is considered in some foreign oil quarters in Italy as an indication that the Italian government intends to eliminate all the foreign interests now drilling and exploring in Sicily. These companies are the Anglo-Iranian Oil Company, the Mediterranean Oil Company, the Gulf Oil Company, and the MacMillan Petroleum Company.

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Oil Development Has Problems in Italy

Italian taxpayers are in the drilling business under the leadership of Signor Enrico Mattei, chairman of the Azienda Generale Italiana Petroli, and Signor Vanoni, Italian minister for finance, who are trying to develop national gas and oil resources. After several months of drilling in the district of San Benigno Canavese, Mario Trisoglio of the mining department of the AGIP, who is supervising the rig, has admitted that no gas or oil traces have been found after reaching a depth of 7800 feet. Drilling operations are to be continued through the lower Miocene to a depth of 9800 feet, when they are to be discontinued if no results are obtained.

AGIP said that important gas traces have been found at Rolo at a depth of 8530 feet. Since this gas shows a heavier distillate content than the Cortemaggiore gas, drilling will be developed up to a depth of 13,100 feet where important oil structures should be found, according to the AGIP geologists.

In the heart of the Leduc-Woodbend field, Devon Branch has been in operation since 1949.

This branch has served oil men in the Turner Valley area for more than 20 years. (above)

Leduc Branch was opened in 1947, the day after the first producing well was brought in. (left)

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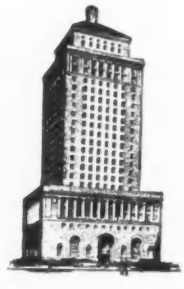

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Canada's Oil Bank

Total assets exceed $2,675,000,000

Extensive Oil Surveys Conducted in Pakistan

Photographic Survey Corporation has been carrying out its portion of the largest photographic survey ever undertaken—a geological survey of Baluchistan and photography and mapping of Pakistan's major land improvement and other development projects.

Part of the crew has left Karachi for Canada to take part in Canada's own immense program of exploration and mapping. At present, Pakistani and Canadian geologists are studying the 5000 photographs which have already been received in Canada. After completing the study of the 25,000 photographs to be produced, geologists expect to begin field operations in November.

Standard-Vacuum Oil Company has also carried out an aero-magnetic survey of East Pakistan and submitted its report to the government.

Sardar Abdur Rab Nishtar, the industries minister, disclosed that Pakistan Petroleum Limited has planned to undertake a detailed geophysical (seismic) survey of East Pakistan oil-bearing areas. Due to difficulties of shipping explosives, he said, such a survey cannot be started until next October. Meanwhile, the company is carrying on a gravity survey in the area.

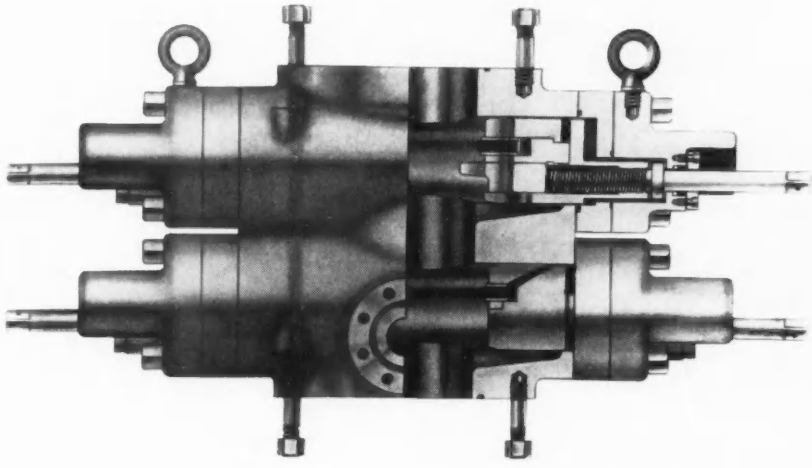
Calcutta Reports Show Oil Search Continuing

Geological Survey of India is looking for oil east of the Sodepore railway station, about 12 miles from Calcutta, in an area known as the "Bengal Basin." The search follows an earlier survey of Kutch and the Bengal Basin, which yielded encouraging results.

Encouraging signs of oil with some high pressure gas have been found in the Assam Oil Company's test well at Naharakatiya in the Brahmputra valley of Assam. Samples of crude tested by experts indicated this oil may contain more gasoline than is generally obtained in the Digboi oil fields. The test well, now 10,016 feet deep, will be drilled deeper.

New Equipment

SUPPLEMENTING COMPOSITE CATALOG



Blowout Preventer

Cameron Iron Works, Inc., has announced a new type pressure-operated blowout preventer. Designated as Type "SS" (Space Saver), this unit is designed for use in areas where many drilling rigs employ substructures which have limited space under the derrick floor. The manufacturer claims that size for size the "SS" blowout preventer requires less room than any other pressure-operated ram type preventer on the market. Most sizes may be readily lowered to the cellar through the rotary table opening without disturbing any beams. This preventer has two sets of rams, each operating independently. Blind rams to effect a shut-off when pipe is out of the hole or pipe rams to effect a positive seal with pipe in the hole may be employed in any desired combination.

This item supplements Cameron Iron Works, Inc., data on pages 1069-1140 of Composite Catalog, 19th Edition.

Circle No. 1 on Postcard

Safety Clamp

Paramount Equipment Co., Inc., has introduced an improved stuffing box safety clamp. The new, light weight, tens-alloy aluminum clamp is spring actuated and is self-supporting on the polished rod. It can be tightened with one hand, leaving the other hand free to support the gland. It is also sturdy enough to use in locating and supporting a heavy polished rod grip while setting it up for pumping service, thus helping to prevent accidents sustained during this operation. The clamp is designed to fit exactly the circumference of various sizes of liners and it eliminates wear and tear caused by regular pipe wrenches used in tightening the liner stuffing box. The new safety clamp has a shipping weight of approximately nine ounces and is boxed and properly identified for inventory purposes.

This item supplements Paramount Equipment Co., Inc., data on page 4113 of Composite Catalog, 19th Edition.

Circle No. 2 on Postcard

Industrial Engine

The production of a new heavy duty industrial engine known as the K-67 has been announced by The Climax Engine and Pump Manufacturing Company. The new model, latest in the Climax Blue Streak series, was designed to furnish power for oil well drilling, water pumps, generators, blowers, snow plows, mud pumps, cranes and compressors. The engine has six cylinders with seven-inch bore and stroke, 1616 cubic inch displacement and a maximum horsepower rating of 280 at 1350 revolutions per minute. The K-67 is said to operate with equal efficiency on natural gas, gasoline, butane or sewage gas with provisions for correct compression ratios and necessary accessories for the particular fuel to be used.

This item supplements Climax Engine and Pump Manufacturing Company data on pages 1282-1285 of Composite Catalog, 19th Edition.

Circle No. 3 on Postcard

Safety Joint

The Bowen Jar safety joint saves the cost of one tool and reduces the rig time required to make up the string. This device requires no torque and provides a powerful upward blow by exerting a straight pull on the string. A series of blows can be delivered as rapidly as the string can be raised and lowered. If the stuck string cannot be jarred loose, the jar safety joint can then be disconnected for recovery of everything above the joint. Later by using the recovered portion of the joint the string can be reconnected with the stuck portion for subsequent recovery operation.

As a jar, this device is capable of striking any number of blows in rapid succession by raising and lowering the fishing string. Without bringing the string out of the hole, the force of the blow can be easily adjusted to obtain any desired heavier blow. As a safety joint, this tool is rugged and dependable. It re-engages easily on run-in for reconnecting to the fish.

This item supplements S. R. Bowen Company data on pages 825-868 of Composite Catalog, 19th Edition.

Circle No. 4 on Postcard

Steel Electrode

Air Reduction Magnolia Company has announced the availability of a new improved E6010 electrode, the Airco 78E, for welding mild steel in all positions. This new electrode offers deep penetration without undercutting, a minimum of spatter, and uniform weld deposits without finger-nailing. The deposit solidifies quickly which especially adapts this electrode for welding in the vertical and overhead positions. The 78E is recommended for the fabrication of mild steel involving plate and rolled sections or castings, fired and unfired pressure vessels, structural frames, pipe lines and all classes of marine work where high ductility and tensile strength are essential.

This item supplements Air Reduction Magnolia Co. data on page 169 of Composite Catalog, 19th Edition.

Circle No. 5 on Postcard

Save time! Keep informed! Circle numbers on postcard, page 245

FHP Motors

Two new special service, fractional-horsepower motors for applications requiring moderately high starting torque, have been announced by the General Electric Company's Fractional Horsepower Motor Department. Rated at one-half and three-fourths horsepower, 1725 revolutions per minute, the new motors can be mounted in any position and are easily reconnectable at the terminal board for 115 or 230 volts. They are smaller and lighter in weight than the corresponding general purpose ratings. With starting currents which conform to NEMA standards, the motors can be used in evaporative coolers, attic fans, milking machines, compressors, garage tools, and home workshops. They are an extension of the one-fourth—one-third hp Form G special-service motor series inaugurated by G. E. last year.

This item supplements General Electric Co., Apparatus Sales Division, data on pages 1949-1968 of Composite Catalog, 19th Edition.

Circle No. 6 on Postcard

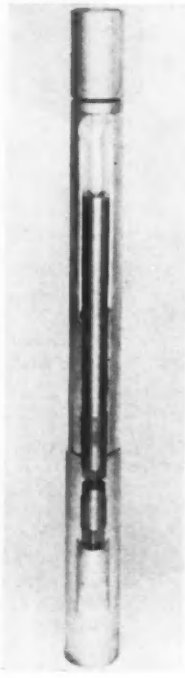
Lubricant Tubes

Two newly designed lubricant tubes, a flat-top gun lubricant tube and a long-spouted bulk lubricant tube, are offered by Rockwell Manufacturing Company for economical lubrication of Nordstrom valves. With the flat-top tube, a lube gun can be loaded in a short time by cutting off the tube top and turning a key which squeezes the contents directly into the barrel. With the long-spouted tube, a valve lube chamber can be filled easier because the spout gets the lube further down into the valve shank than is possible with previous methods. The gun lubricant tubes are available in packages of six; the bulk lubricant tubes singly and in packages of four. Eight types of lubricants are available in the new tubes.

This item supplements Rockwell Manufacturing Company data on pages 3777-3812 of Composite Catalog, 19th Edition.

Circle No. 7 on Postcard

Slide Valve Mandrels



Two new types of mandrels for gas lift valves made by Garrett Oil Tools, Inc. permit the communication port between the tubing and the gas lift valves to be opened or closed by wire line tools. The mandrels contain an internal slide valve, fitted with O-ring sealing members that may be moved to "open" position whenever it is necessary to gas lift the well and moved to "closed" position when gas lift is not required. When the slide valve is in "closed" position, the gas lift valve is completely isolated from flow and pressure within the tubing. The slide valves are the same inside diameter as the tubing string, so that bottom hole pressure bombs and other instruments may be run through them. The Type D-2 mandrel is designed for use with one gas lift valve and the Type D-3 mandrel permits use of two gas lift valves on each mandrel. Greater mandrel strength and more resistance to corrosion are provided in both types of mandrels. The tubing string is suspended on an inner sleeve on which there is no welding. The "lug" end of the mandrel is a one-piece casting on which there is no welding and which has strength equal to that of N-80 tubing. The valve guard is welded to the outer sleeve that is never under tension.

This item supplements Garrett Oil Tools, Inc., data on pages 1865-1928 of Composite Catalog, 19th Edition.

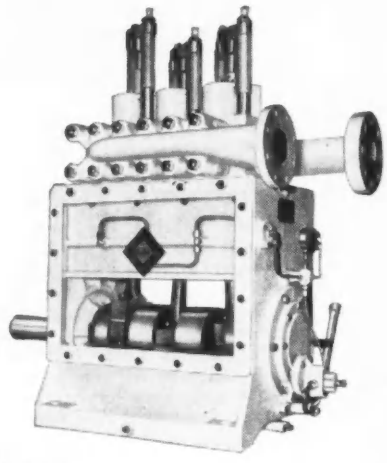
Circle No. 8 on Postcard

Pipeliner Special

The Le Roi-Cleveland SB 30 pipeliner special mounted on a crawler tractor is the heavy duty rig equipped with four drills. The SB 30 is available also with two or three drills in either the heavy duty four-inch class or the lighter three-inch class. Adjustable boom arms make it possible to use the drill outward to almost 45 degrees and inward towards the tractor to almost 30 degrees. Optional remote pilot actuated gang controls are available for mounting on the SB 30. For extra air Le Roi will equip the tractor with the Le Roi 600 CFM compressor mounted on the rear and driven through the power take off. The SB 30 will drill ditch of any width or depth used in pipe line work. Hole spacing can be varied as desired and the rig can operate over strung pipe and other obstacles.

This item supplements Le Roi Company data on pages 3022-3025 of Composite Catalog, 19th Edition.

Circle No. 9 on Postcard



Pump

A new pump primarily designed for fluid injection in oil recovery operations has been developed by Ajax Iron Works. This pump operates in a speed range of from 200 to 400 revolutions per minute and delivers from 429 barrels per day at 100 revolutions per minute up to 1714 barrels per day at 400 rpm with a maximum pressure of 2050 pounds per square inch using the 1¾-inch diameter plunger. The maximum size plunger, 2¾-inch diameter, delivers 1056 barrels per day at 100 rpm and 4234 barrels per day at 400 rpm with a maximum pressure of 825 psi. Designated as the Ajax TP-4000 series pump, this pump is designed for continuous 24-hour per day service. The enclosed power end of the pump affords weather protection. The fluid end is sectionalized and separate from the power end; straight-line flow minimizes turbulence. This pump is designed to team with the Ajax DP-70 11 by 14 gas engine, although it can be used with other types of engines as well. In addition to its use in oil recovery, this pump is applicable for a wide variety of industrial applications, including pumping oil, brines, acids and alkalies, solvents, wastes and other hydraulic pressure service.

This item supplements Ajax Iron Works data on pages 170-171 of Composite Catalog, 19th Edition.

Circle No. 10 on Postcard

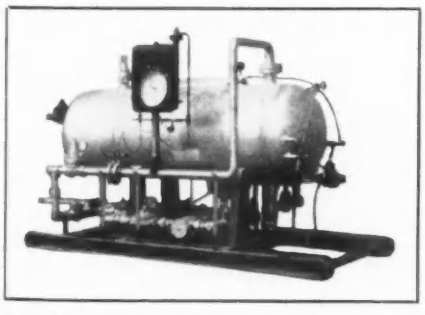
Save time! Keep informed! Circle numbers on postcard, page 245

Other New Equipment

Electronic Calculator

International Business Machines Corporation has installed the first production model of the company's newest and most powerful high-speed electronic calculators, the "701." Composed of eleven compact and connected units known as IBM electronic data processing machines, the 701 is the first calculator of comparable capacity to be produced in quantity. It uses three advanced electronic storage of memory devices—cathode ray tubes, magnetic drums and magnetic tapes. A total of 18 will be built within a year, all consigned to government agencies or defense industries. The calculators will be used for the calculation of radiation effects in atomic energy, for aerodynamic computations for planes and guided missiles, including vibration and stress analysis, design and performance computations for jet and rocket engines, propellers, landing gear, radomes; on studies related to the effectiveness of various weapons, and on steam and gas turbine design calculations. In the center of the units pictured is the electronic analytical control unit and at its right is a card reader. Behind the control unit is the power distribution unit. On the left are the magnetic drum storage unit and the electrostatic storage unit. In the group at the right are two magnetic tape readers and recorders, the alphabetical and numerical printer and the card punch. In this installation, the two power supply units are not visible.

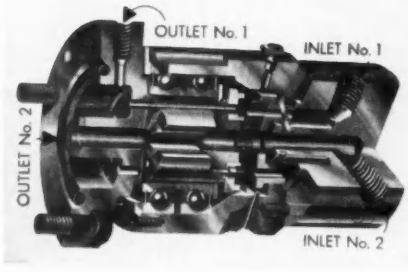
Circle No. 11 on Postcard



Test Separator

A new test separator for testing individual oil and gas wells is designed to separate the well fluid into the three phases of oil, gas and water; meter each of these fluids accurately; sample the oil automatically to determine the water content; and discharge each fluid separately or recombined as desired. The unit is for permanent installation at least manifolds or tank batteries to replace conventional oil and gas separators and test tanks. Advantages of the test separator are its lower overall cost and lower installation cost, and the testing of individual wells without shutting down other wells. Oil Metering and Processing Equipment Corporation's Model 30WT-1006S will handle up to 1800 barrels of oil per day, 900 barrels of water per day and 4,000,000 standard cubic feet of gas a day at 125 pounds per square inch working pressure. Test separators are available in any size and working pressure required.

Circle No. 12 on Postcard



Double Rotating Union

A new double rotating air union designed to convey air to two clutches mounted on the same shaft has been announced by Deublin Company. Known as the Deublin Deu-Plex Model 1500, this equipment is interchangeable with present double rotating unions. It has leak-proof air seal with lapped Mechanite face running against a lapped carbon with both seal faces lapped to three millionths of an inch surface finish; new balanced sealing to avoid increased load from line pressure on seal face; minimum torque for higher operating speeds; maximum speed of 3500 revolutions per minute and maximum pressure of 150 pounds per square inch.

Circle No. 13 on Postcard

Relief Valves

ECONO-THERM relief valves, Type V Series, manufactured by A. W. Cash Valve Mfg. Corp., are low cost valves, affording a completely automatic reseating temperature and pressure relief valve for a few cents more than many conventional fuse plug types. To maintain water in domestic hot water tanks and heaters at safe normal temperatures, water above 208 degrees must be allowed to escape by way of a temperature actuated relief valve. Pressure relief valves alone cannot reduce dangerously high temperature, the cause of water heater explosion. ECONO-THERM relief valves are designed for complete and automatic protection: Available in either the regular or stem type and with or without try levers, the regular valve is for ordinary hot water storage heater installation and the stem type is recommended for electric heaters, insulated tanks and installations wherein close nipples cannot be used. Standard factory pressure relief setting is 125 pounds.

Circle No. 14 on Postcard

Alloy-Coated Electrode

A new electrode recently has been marketed by Stoody Company under the name "Stoody Build-Up." The electrode was developed to provide exact properties necessary in a material used for rebuilding carbon steel and alloy steel parts—sound deposits, high tensile strength, toughness and resistance to cold flowing. As an underbase it is recommended generally for such parts as drive sprockets, churn drills, shovel drive tumblers and house rolls, tractor rollers and idlers, tool joint shoulders and clutch jaws. Stoody Build-Up is an extruded alloy-coated electrode designed to produce an alloy steel deposit of consistent medium hardness of 29-31 Rockwell C under normal conditions. Deposits are affected by heat treatment and will react to abnormal temperature ranges like any other alloy steel.

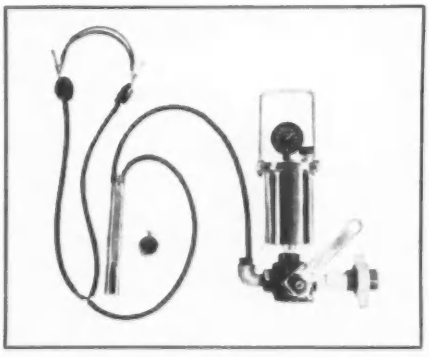
Circle No. 15 on Postcard

Save time! Keep informed! Circle numbers on postcard, page 245

Steel Tape

Evans & Co., manufacturers of Evans "White-Tapes," has announced a new line of 25, 50, 75 and 100-foot premium steel tapes at half the price previously charged for tapes of corresponding quality. Made of three-eighths-inch wide high carbon steel, hardened tempered and Bonderized, the tape is enameled in white and numbered in black. Markings indicate feet, inches and eighths. A hook-ring combination is attached to the tape end, making it possible for one man to measure. A heavy gauge plastic carrying case for storage or as a utility box is provided with the tape. The case is of heavy leather-grained DuPont vinyl and a chrome plated wind-up handle folds into the case when not in use.

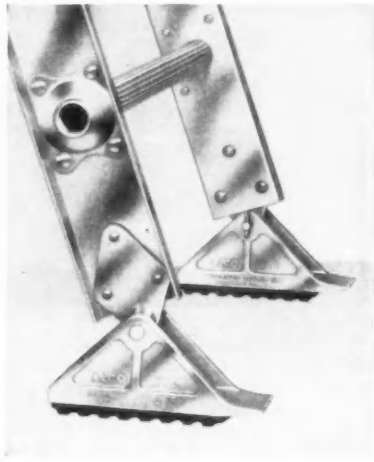
Circle No. 16 on Postcard



Well Instruments

Development of a portable instrument light enough to be carried in the pumper's truck has been announced by Howard Supply Company. Known as the fluid log, the instrument is a means of quickly determining the fluid level in oil wells. The fluid log is attached to the well head by means of a wing union. The fluid level of a well can be determined in less than five minutes. Being manually operated, no wires or batteries are required to send the pressure waves down the well, this being accomplished by means of a simple tuning fork. The manufacturer's claims for the instrument include low initial cost, efficient pumping obtained by frequent check of fluid level, and elimination of pulling jobs where the instrument shows the well has been pumped down. It permits inexpensive reservoir analysis and bottom hole pressures may be computed.

Circle No. 17 on Postcard



Safety Shoe

Aluminum Ladder Company, Worthington, Penn., has announced the new Alco-Lite all-aluminum safety shoe for straight and extension ladders. The Alco-Lite safety shoe is of cast aluminum and can be used with either the rubber tread or spike on the floor surface. Because it will not throw sparks, it is particularly suitable for use around fuels and other volatile fluids. Alco-Lite safety shoes can be attached to almost any metal or wooden ladder.

Circle No. 18 on Postcard

Corrosion Inhibitor

The Tretolite Corporation has announced the development of a new oil-soluble organic corrosion inhibitor especially designed to prevent corrosion and rust formation in pipelines, tankers and storage. Designated as Kontol 77, this product has been developed for protection against acidic components found in crude oils and has been demonstrated to be effective against rusting caused by the presence of oxygen in finished petroleum products. Employing ASTM Test D-665, aviation grade gasolines are rendered non-rusting when inhibited with only 3 ppm Kontol 77. This corrosion inhibitor has been compounded to have no adverse effects when used in high quality petroleum products. For example, 100/130 octane gasoline inhibited with 14 ppm of Kontol 77 exhibits no change in color, octane number, accelerated gum precipitated lead or other aviation gasoline specification.

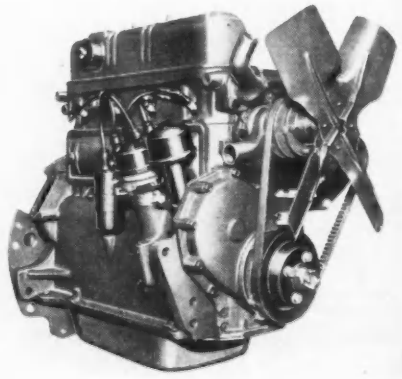
Circle No. 19 on Postcard

Pump Plunger Extensions

Williams marvel pump plunger extensions with spiral grooved channels will catch and divert sand particles which attempt to enter between the plunger and the cylinder walls. These extensions, manufactured by R. C. Williams & Co., will keep plungers from sticking and will increase the life of plungers. They will fit any standard API plungers and can be adjusted to perfect alignment with the plunger. The extensions are available in hard steel, chrome plated and stainless steel.

These marvel pump plunger extensions are manufactured by R. C. Williams & Co., manufacturers of Williams lower valve pullers, oil well marvel pumps, plunger and plunger extensions.

Circle No. 20 on Postcard



Industrial Engine

Ford Motor Company has announced the addition of a four-cylinder overhead-valve model to its series of heavy-duty industrial engines. The Ford "134" has been designed for maximum efficiency, performance and operating economy and develops 45 brake horsepower at 2400 revolutions per minute. It has a 3.4375-inch bore and a 3.6-inch stroke to reduce wear and improve fuel economy. Low-friction overhead-valves help to deliver more horsepower per cubic inch displacement. Cylinders are cast en bloc of special high-grade iron and centrifugal cast sleeves are used permitting longer cylinder life. Free-turn valves are of high chrome nickel alloy.

Circle No. 21 on Postcard

Save time! Keep informed! Circle numbers on postcard, page 245

Extra Strength for Extra Depth!

NATIONAL SEAMLESS drill pipe... casing... tubing

IN deep well drilling, high strength is mandatory. And it is significant that the search for greater strength has brought about this result —At the present time, all drill pipe, practically all tubing, and a very large portion of casing are made *seamless*. The seamless process, however, can be applied only to steel of the very best forging properties and of absolute uniformity, since piercing the solid billet tends to search out any defect in the steel.

National Tube, in the true pioneer spirit, has continually improved the steel, both in composition and physical properties to meet those increasingly severe conditions that call for the utmost in strength. Thus, National Seamless Oil Country Tubular material gives you maximum security. Work it hard, work it deep—with complete confidence. Its strength is insurance against fatigue and twisting action, its high collapse resistance the best defense against deep hole trouble.

For complete information on National Seamless drill pipe, casing, and tubing, write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Ask for Bulletin No. 15.

Significant NATIONAL TUBE DEVELOPMENTS

1. Deoxidized Bessemer Steel Casing and Tubing
2. Warm-Worked Casing
3. Threaded and Coupled Drill Pipe
4. Deep-Well Casing
5. (B) Buttress-Thread Casing

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NATIONAL SEAMLESS drill pipe...casing...tubing

USS TRADE MARK

UNITED STATES STEEL

New Catalogs and Equipment Literature

Petroleum Book Catalog

The Book Department of Gulf Publishing Company has available free on request a new Catalog of Petroleum Books published by or available for ordering through the Book Department. The Catalog gives descriptions, subject material and prices on more than 125 currently available books written by authorities on nearly every phase of the petroleum and related industries.

Circle No. 22 on Postcard

Asphaltic Coatings

New industrial asphaltic coatings containing an exclusive additive which permits application over damp surfaces have been announced by Spring Packing Corporation. This permits application of waterproof or anti-corrosive coatings under moist or excessively humid conditions and eliminates man hours lost while waiting for surfaces to dry completely. This new line of Spring-Kote cutback asphalt mastics provides complete protection to equipment and buildings within an extended temperature service range of —40 degrees Fahrenheit to 450 degrees Fahrenheit. Spring-Kote contains finely-ground amorphous fillers which increase the weather resistance and service life of the coating. Uses and application are described in a bulletin available from Spring Packing Corporation.

Circle No. 23 on Postcard

Pumping Unit

An eight-page bulletin has been released by W. C. Norris Manufacturer, Inc., describing the Model CB-3-10 hydraulic long stroke pumping unit. Bulletin 36-A is illustrated with line drawings and photographs showing the design, installation, operation, performance and general specifications of the unit. Photographs show field installations and the pumping conditions.

Circle No. 24 on Postcard

Baby Digger

The Cleveland Trencher Company has issued an eight-page bulletin on the improved Cleveland model 92 which is now equipped with a four-speed motor transmission. The new unit doubles the number of digging wheel and traction speeds previously available in the 92. Highly maneuverable and mobile, the compact model 92 is designed for use on cramped city and suburban jobs. The 48 evenly graduated speed combinations provided by the transmission give the 92 the 30 or more usable digging speed combinations providing the right speed and power for every type of soil and digging condition. Emphasis is placed on the fast mobility of the Model 92 teamed with its partner the Model T-5 trailer. Complete dimensions and specifications are given, including a table of optional digging widths.

Circle No. 25 on Postcard

New R/M V-Belt Catalog

A new fractional horsepower V-belt catalog for use in servicing light duty applications has been announced by Raybestos-Manhattan, Inc. In this catalog belts are listed according to the new industry-standard numbering system. Various type machines are listed together alphabetically by company or trade names for convenience in determining the proper belt.

Circle No. 26 on Postcard

Microwave Radio

Application of the new 2000-mc microwave radio equipment to the pipe line industry is described in a new booklet available from the Westinghouse Electric Corporation. Features of the Type FR microwave radio and Type FJ multiplexing equipment and their importance to the pipe line industry are discussed. Points covered include frequency division multiplexing, crystal frequency control, standby equipment, maintenance features and many others.

Circle No. 27 on Postcard

Mechanical and Hydraulic Jacks

A general catalog has been issued on its line of mechanical and hydraulic jacks, hydraulic pullers and special purpose jacks by Templeton, Kenly and Company. The catalog is letter-sized and contains 34 pages of application pictures and information, detail drawings, specifications, plus a full listing and illustration of all accessories and attachments that are available. Included are the Simplex Re-Mo-Trol, the remote controlled hydraulic jack with new safety features, the Rol-Toe Foot Lift for lifting heavy transformers that have minimum clearance under them, ratchet lowering jacks, screw jacks and a variety of special purpose jacks such as mine roof jacks, trench braces, tie removers and replacers and many more.

Circle No. 28 on Postcard

Oil Well Pumping Motors

A new bulletin on oil well pumping motors has been prepared and released by the Louis Allis Company. The illustrated bulletin covers the various enclosures and electrical characteristics available in these special motors. It also includes information and performance curves on Louis Allis triple rated motors which provide three horsepower ratings in one motor.

Circle No. 29 on Postcard

Emulsion Stabilizers

Unique stability can be imparted to oil-in-water emulsions through the use of a group of lignosulfonate surfactants, trade-named Marasperse. The Marasperses differ from conventional emulsifiers in that they have little effect on interfacial tensions. When used properly they can render o/w emulsions stable to the often damaging effects of temperature variations, pH changes, electrolytic contamination and mechanical handling. Bulletin No. 119 issued by Marathon Corporation, Chemical Division, describes the Marasperses, the manner in which they function and the advantages in their use.

Circle No. 30 on Postcard

Wires and Cables

The electrical wire and cable department of United States Rubber Company has published a new 76-page booklet entitled "U. S. Electrical Wires and Cables for the Chemical and Petroleum Industries." The booklet is divided into four main sections: insulation compounds, jacket compounds, constructions and technical data. The compound sections have been expanded to include butyl insulation, heat and moisture-resistant insulations, thermoplastic types, the general-purpose neoprene jacket and the polyvinyl chloride type jacket.

Circle No. 31 on Postcard

Low Hydrogen Electrodes

Alloy Rods Company has published a new eight-page technical bulletin entitled "The Facts About Low Hydrogen Electrodes." This bulletin deals with recent technical developments in the low hydrogen electrode field, with chapters devoted to history of this type of electrode, effects of hydrogen, effects of the basic slag, control of hydrogen, welding procedures and applications.

Circle No. 32 on Postcard

Save time! Keep informed! Circle numbers on postcard, page 245

It's better to work with

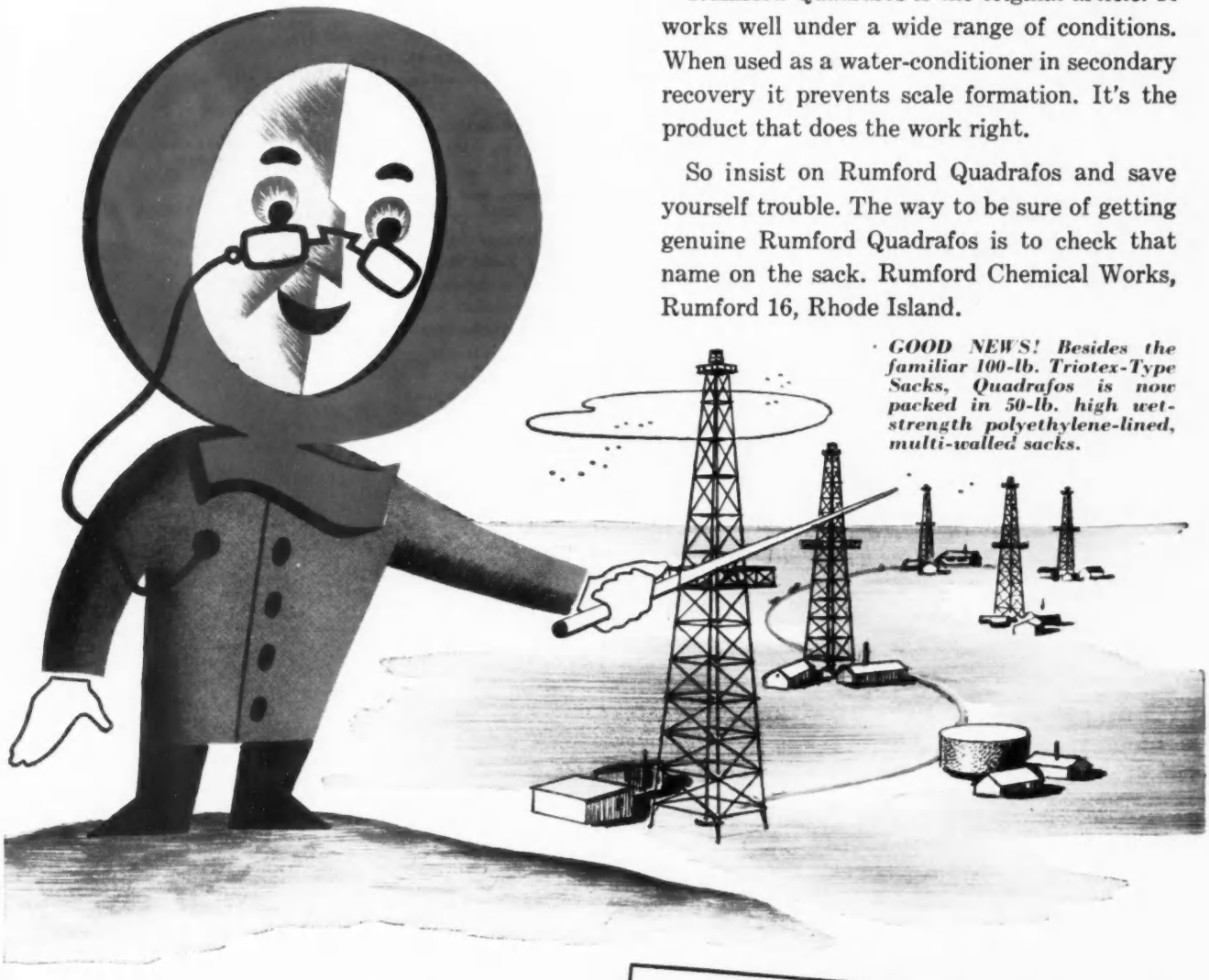
RUMFORD QUADRAFOS*

than to worry with a substitute

Every mud engineer, tool pusher and roughneck knows Quadrafos — what it will do, what to expect from it in mud-thinning. Nobody wants a substitute — and nobody needs to take one.

Rumford Quadrafos is the original article. It works well under a wide range of conditions. When used as a water-conditioner in secondary recovery it prevents scale formation. It's the product that does the work right.

So insist on Rumford Quadrafos and save yourself trouble. The way to be sure of getting genuine Rumford Quadrafos is to check that name on the sack. Rumford Chemical Works, Rumford 16, Rhode Island.



* *GOOD NEWS! Besides the familiar 100-lb. Triotex-Type Sacks, Quadrafos is now packed in 50-lb. high wet-strength polyethylene-lined, multi-walled sacks.*

The "Old Reliable"... First in the Field

ONLY WITH
QUADRAFOS
CAN WATER
DO SO MUCH, SO WELL

*Reg. U. S. Pat. Off.

Catalogs AND EQUIPMENT *Literature* OFFERED IN THIS ISSUE'S ADVERTISEMENTS

Copies may be obtained easily and without cost by using the Reader Service Postcard on Page 245. Just circle on the card the number at the end of each item in which you are interested.

AERIAL SURVEYS—Information. Abrams Aerial Survey Corp. See page 278.
Circle A1 on postcard.

CABLE TOOLS—Information. Acme Fishing Tool Co. See page 284.
Circle A2 on postcard.

TUBING SPIDER—Bulletin TS-54. Advance Oil Tool Co. See page 208.
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LIQUID GRAVITOMETER—Bulletin 111-R2. American Recording Chart Co. See page 270.
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ROLLER BEARINGS—Catalog. American Roller Bearing Co. See page 45.
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HOSE ASSEMBLIES AND CLAMP-TYPE COUPLINGS—Information. Anchor Coupling Co. See page 25.
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ACOUSTICAL WELL SOUNDER—Information. Associated Equipment Co. See page 175.
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HYDRAULIC PUMPING UNIT—Bulletin 5305. Axelson Manufacturing Co. See pages 168-169.
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SCRATCHERS AND CENTRALIZERS—Ruler. B & W Incorporated. See page 276.
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CIRCULAR BLANKS—Booklet 216. Bethlehem Steel Co. See page 87.
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POWERED SWIVELS—Literature. S. R. Bowen Co. See page 291.
Circle C8 on postcard.

ROTARY BRUSH CUTTER—Information. E. L. Caldwell & Sons. See page 226.
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ROTARY OR CABLE TOOL RIG—Catalog. Cardwell Manufacturing Co. See pages 78-79.
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DEPTHOMETER—Bulletin. The Cavins Co. See page 208.
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ACIDIZING SERVICE—Information. Dowell Incorporated. See pages 12-13.
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SLUSH PUMPS—Bulletin B-191. Emsco Manufacturing Co. See page 41.
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PACKINGS, PISTON RINGS AND VALVE DISCS—Information. France Packing Co. See page 296.
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PUMPS—Catalog. Gaso Pump & Burner Mfg. Co. See page 209.
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WELL LOGGING—Brochure. Geological Well Service Co. See page 296.
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ATTRACTOMETER—Information. Geophysical Survey Syndicate. See page 285.
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FLOORING, METAL—Information. The Globe Co. See page 287.
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ROTARY HOSE COUPLING—Details. The Goodyear Tire & Rubber Co. See page 7.
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CENTRIFUGAL PUMPS—Bulletin No. 7-LW-13. The Gorman-Rupp Co. See page 292.
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REAMERS—Bulletin 43-A. Grant Oil Tool Co. See page 264.
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LEASE RENTAL HOUSING—Details. Houston Ready-Cut House Co. See page 202.
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PARAFFIN SCRAPERS—Information. J. M. Huber Corp. See page 294.
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PUMPING UNITS—Catalog. Jensen Brothers Manufacturing Co. See page 204.
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THREAD LUBRICANT AND SEAL—Details. Jet-Lube, Inc. See page 288.
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MAGNETIC FISHING TOOLS—Information. K & G Oil Tool & Service Co. See page 33.
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MOBILE EQUIPMENT—Catalog. Kaat Engineering Corp. See page 198.
Circle K6 on postcard.

RELIEF VALVE—Bulletin 11250. Kinzbach Tool Co. See page 52.
Circle L1 on postcard.

FLOAT SHOE—Catalog. Larkin Packer Co. See page 164.
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PLUNGERS—Catalog. John N. Martin, Manufacturer. See page 206.
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BULLET AND GLASS JET PERFORATORS—Booklet. McCullough Tool Co. See page 293.
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PHOSPHATES FOR MUD CONTROL—Information. Monsanto Chemical Co. See page 46.
Circle N2 on postcard.

TRAILER-MOUNTED MAST—Information. Lee C. Moore Corp. See pages 100-101.
Circle N3 on postcard.

WELLHEAD EQUIPMENT—Bulletin. The National Supply Co. See pages 71-74.
Circle N5 on postcard.

SEAMLESS DRILL PIPE, CASING AND TUBING—Bulletin No. 15. National Tube Division, United States Steel Corp. See page 251.
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PUMPS—Information. The New York Air Brake Co. See page 267.
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CASING HEADS—Brochure C-20. Oil Center Tool Co. See page 155.
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CROWN AND TRAVELING BLOCKS—Booklet No. 10-53. Oil Well Supply Division, United States Steel Corp. See page 8.
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ELECTRIC PLANTS—Specifications. D. W. Onan & Sons, Inc. See page 276.
Circle P4 on postcard.

PLUNGER PUMPS—Bulletin 120. Pacific Pumps Inc. See page 277.
Circle P5 on postcard.

TUBING ANCHOR—Information. Page Oil Tools, Inc. See page 51.
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CROWN BLOCKS—Bulletin. Regan Forge & Engineering Co. See page 272.
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WELL CHECKERS—Bulletin. Rolo Manufacturing Co. See page 266.
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MUD PITS—Catalog. S & R Tool & Supply Co. See page 285.
Circle Q7 on postcard.

BLOWOUT PREVENTER AND STRIPPER—Catalog. Shaffer Tool Works. See page 37.
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PUMPING UNIT—Literature. Southern Engine & Pump Co. See page 285.
Circle R8 on postcard.

PREFABRICATED HOUSES—Information. Southern Mill & Manufacturing Co. See page 265.
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HYDRAULIC JACKS AND PULLERS—Information. Templeton, Kenly & Co. See page 154.
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ANTI-CORROSION LINING—Bulletin TK-43. Tube-Kote, Inc. See page 268.
Circle S10 on postcard.

HANDBOOK OF WIRE ROPE FOR WELL DRILLING. Union Wire Rope Corp. See pages 22-23.
Circle T2 on postcard.

TANK GAUGE RECEIVER—Bulletin CP-3003. The Vapor Recovery Systems Co. See page 225.
Circle T4 on postcard.

PIPE COUPLINGS, FITTINGS AND GROOVING TOOLS—Catalog-Manuals Nos. 44-81. Victaulic Company of America. See page 161.
Circle T5 on postcard.

OIL TREATING COMPOUND—Information. Visco Products Co. See page 9.
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FLAGGING TAPE—Information. The Visking Corp. See page 283.
Circle T7 on postcard.

GAS POWER UNITS—Bulletin 1481. Waukesha Motor Co. See page 258.
Circle T10 on postcard.

CATHEADS—Details. Wichita Falls Foundry & Machine Co. See page 151.
Circle U5 on postcard.

WATER-FLOODING—Bulletin WP-1099-B-59. Worthington Corp. See pages 156-157.
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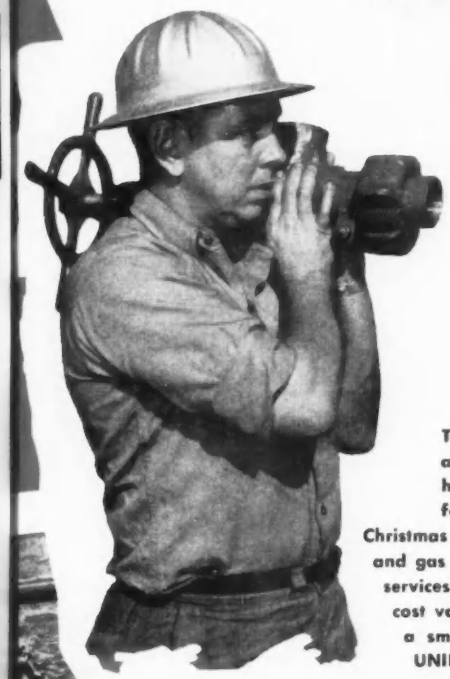
wherever flow control is important

UNIBOLT

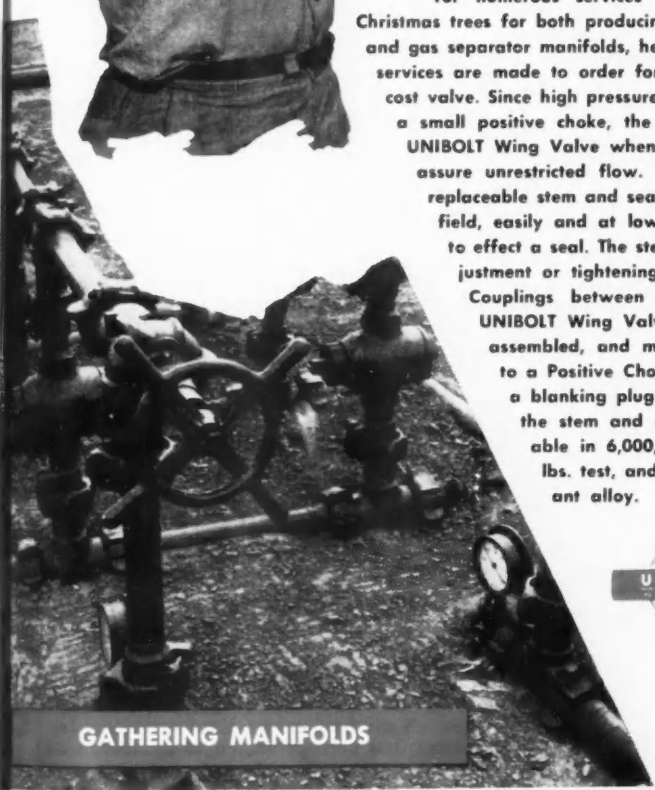
adjustable wing valves

are your best bet !

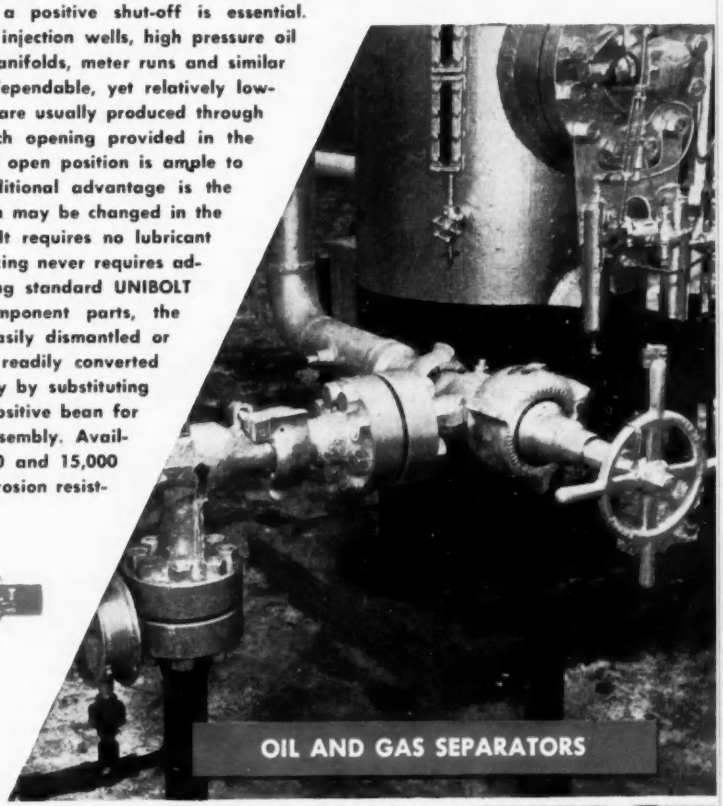


The UNIBOLT Wing Valve, designed originally for use as an adjustable choke where well conditions did not demand a positive choke, has become popular with production men as a dependable valve for numerous services where a positive shut-off is essential. Christmas trees for both producing and injection wells, high pressure oil and gas separator manifolds, heater manifolds, meter runs and similar services are made to order for this dependable, yet relatively low-cost valve. Since high pressure wells are usually produced through a small positive choke, the one-inch opening provided in the UNIBOLT Wing Valve when in full open position is ample to assure unrestricted flow. An additional advantage is the replaceable stem and seat, which may be changed in the field, easily and at low cost. It requires no lubricant to effect a seal. The stem packing never requires adjustment or tightening. Having standard UNIBOLT Couplings between its component parts, the UNIBOLT Wing Valve is easily dismantled or assembled, and may be readily converted to a Positive Choke Body by substituting a blanking plug and positive bean for the stem and seat assembly. Available in 6,000, 10,000 and 15,000 lbs. test, and in corrosion resistant alloy.

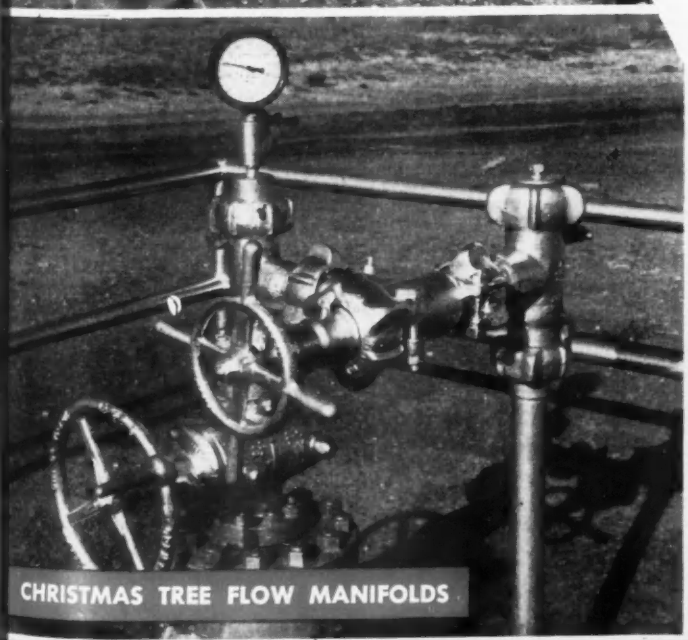
UNIBOLT



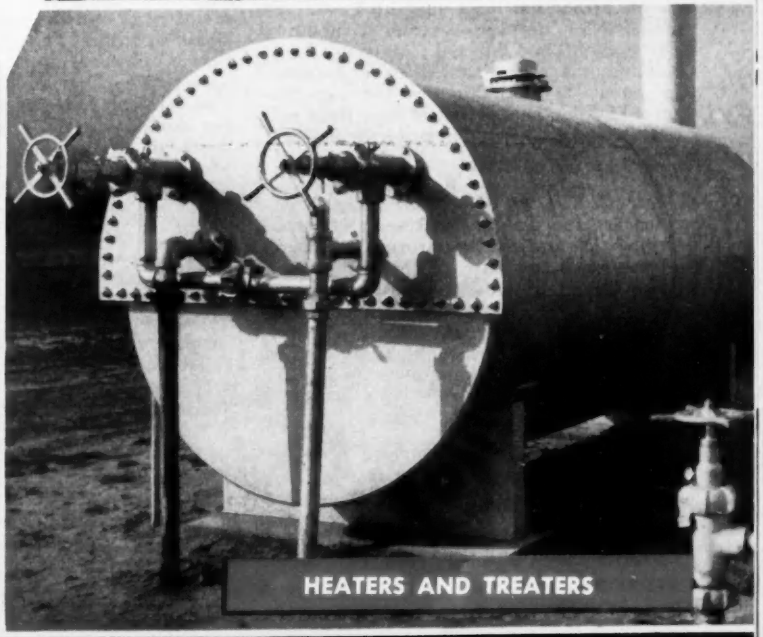
GATHERING MANIFOLDS



OIL AND GAS SEPARATORS



CHRISTMAS TREE FLOW MANIFOLDS



HEATERS AND TREATERS

THORNHILL-CRAVER COMPANY • P. O. BOX 1184 • HOUSTON, TEXAS

What's Happening

AMONG MEN IN THE INDUSTRY

Dr. Richard V. Hughes has been appointed technical assistant to the vice president of Gulf Oil Corporation, Houston Division, succeeding **Paul Weaver**, who retired recently. Hughes joined Gulf in June, 1953, from Stanford University, where he had served as visiting lecturer, professor and head of the Department of Petroleum Engineering since 1949. While at Stanford he also did some consulting work in secondary oil recovery and spent last summer with Gulf working on oil production problems.

Richard V. Hughes

•

Harry A. Buchanan, formerly superintendent of field operations for Bell & Durden, Inc., drilling contractors, has been elected vice president of the company. Buchanan was active in the Sante Fe Springs boom of 1929, when he was a driler for George F. Getty. He was with Kettleman North Dome Association at Kettleman Hills for many years and prior to joining Bell & Durden, he was northern district superintendent for Loffland Brothers.

•

Harry R. Moseley has been appointed Gulf Coast division superintendent for Texas Eastern Production Corporation of Houston. Moseley, who joined the company in December, 1951, as district petroleum engineer in the district office in Shreveport, La., was transferred to the Houston office in December, 1952. Before joining Texas Eastern, Moseley was associated with The California Company as a petroleum engineer in Brookhaven, Miss.

•

R. M. Miller has been appointed assistant manager of the Los Angeles Production Division of The Ohio Oil Company. **W. T. Kennedy** has been named division superintendent of production of the Los Angeles Division succeeding Miller. Both will continue to be located in Bakersfield, Calif.

•

George C. Gester, Jr., senior research engineer at the California Research Corporation's Richmond laboratories, has been selected to participate in the 1953 Sloan Fellowship program for executive development at Massachusetts Institute of Technology. Gester, 35, was sponsored as a candidate by Standard Oil Company of California, parent company of Cal Research.

•

Richard Porter has been named area gas engineer for Shell Oil Company in New Orleans to replace **J. M. Dillon, Jr.**, recently promoted to superintendent of Shell's Elk City, Oklahoma, gas plant. Porter has been in Shell's New York office for the past two years. Prior to that he was with Shell in Houston as a gas design engineer and with the company in Magnolia, Ark., Sheridan, Texas; and Orlando, Okla.

•

Clyde Brown, who has been associated with Continental Oil Company's oil and gas production operations since 1937, has been promoted to proration engineer for the company's southern region with headquarters in Houston. Conoco also announced the promotions of **C. B. Hickernell** and **Howard C. Briggs** to assistant to the general management of the southern and western regions.

•

A new board of directors for the Macmillan Petroleum Corporation was named recently to assist the management in decisions and policy making. Those named to the new board are **R. S. Macmillan** and **S. M. Batterson** of Macmillan Petroleum Corporation; **Lee B. Price**, Pacific Coast manager, Time, Inc., San Francisco; **Gordon Topham**, insurance, president of John Topham & Sons, Inc., Los Angeles; **B. P. Lester** of Lester, Ryons & Co., investment bankers, Los Angeles; **Shepard Mitchell** of Mitchell, Silberberg & Knupp, attorneys, Los Angeles; and **Eddie J. Martin**, rancher and automobile dealer, Santa Ana, Calif.

•

Leonard A. Braly has been appointed division landman for the Mid-Continent division of Cities Service Oil Company (Del.). Braly, who has been district landman for the company in Oklahoma City, will have headquarters in Bartlesville. **Baron Housel**, a new employee, will succeed Braly as district landman.

•

J. W. Vanderbeek has been named district geologist of Stanolind Oil & Gas Company at Bismarck, N. D., replacing **R. T. Stotler, Jr.**, who has been named a senior staff geologist in the Fort Worth division office. Vanderbeek, former division geophysical coordinator in Casper, joined Stanolind in 1947 as a geologic scout. In 1948 he served as a geologist in the company's Foreign Exploration department in Bogota, Colombia, and later was employed in the Canadian division office in Calgary, Alberta, Canada.

•

W. P. Carver has been appointed assistant manager of General Petroleum Corporation's Land department. Carver has been with the company for 14 years and for the last year has served as assistant to the Land department manager. Previously he was in charge of land matters for the San Joaquin Valley area of California.

•

William M. Schulz has been promoted to division geologist for the Mid-Continent division of Cities Service Oil Company (Del.). Schulz will continue to make his headquarters in Bartlesville, Okla.

William F. Brown

John G. Staudt

William F. Brown, petroleum geologist of Mt. Pleasant, Mich., and **John G. Staudt**, executive vice president of Dowell Incorporated of Tulsa, have been elected to the board of directors of the Brazos Oil and Gas Company. **Calvin A. Campbell** of Midland, Mich., has retired from the board. Brazos Oil and Gas Company is a subsidiary of the Dow Chemical Company engaged in petroleum exploration. A University of Michigan graduate, Brown has been employed by the Michigan Geological Survey, the Crystaolite Reduction Company, the geological department of The Pure Oil Company, and the Cities Service Company. Since 1932 he has been engaged in a consulting business in geology and production of minerals and oil with operations in Michigan, Indiana, Illinois, Oklahoma and Texas. Staudt was with Dow Chemical before he joined Dowell as salesman in 1932. Later he became research engineer, assistant general manager, vice president and general manager and executive vice president.

•

S. A. Brown, Shreveport, La., division land superintendent for Continental Oil Company's southern region Exploration department, has been promoted to assistant land superintendent of the southern region with headquarters in Houston. **G. D. Moore**, Houston, landman since 1947 and former Houston division land superintendent, has been appointed division land superintendent at Shreveport, succeeding Brown.

•

Herschel M. Glasgow has been appointed geologist for the Houston district of the Houston Natural Gas Production Company, subsidiary recently formed by Houston Natural Gas Corporation. A graduate of Texas Christian University, Glasgow was with Standard Oil of Texas for five years before joining Houston Natural Gas.

•

Richard J. Gonzalez has been elected treasurer of Humble Oil & Refining Company succeeding **David B. Harris**, who resigned recently. Gonzalez, who joined the company in 1937, is the director in charge of economics and statistics and has been a member of Humble's board since 1951. Harris continues as a vice president and director of the company until his retirement in August.

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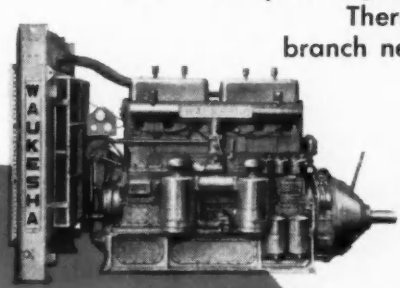

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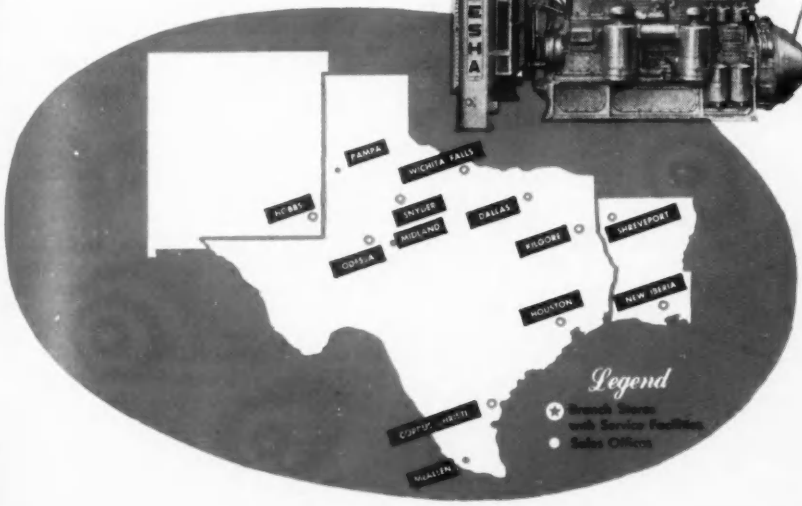

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Marshall D. Storts, scout with Shell Oil Company, has been transferred from Bismarck, N. D., to Evansville, Ind.

•

N. D. (Polly) Clark has resigned as chief geologist for John Lindas Oil, Inc., and is now a consultant at Wichita, Kansas. Prior to joining Lindas, Clark was with Transwestern Oil Company and Lion Oil Company.

•

Union Oil Company of California has announced the following personnel changes: **H. W. Sanders,** vice president, treasurer and member of the executive committee, resigned as treasurer to assume responsibilities of financial vice president and director of public relations—advertising; **Irving J. Hancock,** comptroller, elected treasurer; **Charles F. Parker,** resigned as assistant comptroller and elected assistant treasurer to head a new department of Economics and Financial Research; **C. Haines Finnell,** director of public relations, appointed manager of the new department of Market Research and Development; **Earl M. Welty,** supervisor press-public relations, appointed assistant to financial vice president; and **Alfred G. Norris** appointed supervisor public relations.

•

Appointment of two petroleum engineers to new positions with Continental Oil Company has been announced. **R. L. Adams,** Ponca City, Okla., North Oklahoma district production superintendent for Conoco, is transferred to Ardmore, Okla., as South Oklahoma district production superintendent. **William Drassen,** Ardmore, South Oklahoma district production superintendent, is transferred to Ponca City as North Oklahoma superintendent succeeding Adams.

W. Alton Jones Burl S. Watson

W. Alton Jones has been elected chairman of the board of directors of Cities Service Company and **Burl S. Watson** has been named president. Jones will serve as the company's chief executive officer in charge of supervision and direction of its affairs. As chairman Jones will turn over to Watson certain administrative duties and devote increasing attention to the long-range expansion and development of the Cities Service oil and natural gas interests. Watson, formerly executive vice president, has been associated with Cities Service for 36 years, joining it as a cadet engineer in 1917 after graduation from the University of Alabama. Jones became president of Cities Service in 1940, succeeding the late Henry L. Doherty.

•

D. F. (Sandy) Sandifer has resigned as district geologist for Anderson-Prichard Oil Corporation in San Antonio, Texas, and is now a consulting geologist with offices at 1745 Milam Building, San Antonio.

•

E. C. Wells, Max C. Sons and **P. D. Baker,** The Carter Oil Company, Tulsa, have been promoted to assistant to the production manager, chief petroleum engineer, and assistant chief petroleum engineer, respectively.

•

Glenn Alderman, D. D. Day and **R. O. Alert** have formed the Alderman Drilling Company, Inc., with headquarters in Tulsa.

•

Gordon F. Sawdy and **Donald E. Walter,** former employes of The Ryder Scott Company, petroleum engineers, at Bradford, Penn., and Wichita Falls, Texas, have been taken into the partnership. A former partner, **Maynard M. Stephens,** who moved from Bradford to Wichita Falls a year ago, has joined the Drill Well Oil Company of Wichita Falls, as a partner.

•

Arnold S. Bunte of Roswell, N. M., has been appointed associate professor of geology at the Colorado School of Mines for the 1953-54 academic year. Bunte is currently serving as division manager of the Permian Basin for Vickers Petroleum Company. Bunte has been associated with Vickers since 1941, serving as chief geologist, chief engineer and exploration manager. In 1951 he was promoted to division manager.

•

George Jenkins, district geologist at Shreveport, La. for La Gloria Corp., has been transferred to Lafayette, La.

•

James A. Burhans of Evansville, Ind., has joined Calvert Exploration Company and moved to Bismarck, N. D., to open an office for the company.

•

Floyd Whaley, Eugene H. White and **Kenneth Faith** have organized the Whaley Oil Corp. with headquarters at Mt. Carmel, Ill.

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James W. Nicholas, formerly drilling and development engineer in Stanolind Oil and Gas Company's Gulf Coast Division, has recently joined Housh Drilling Company of Houston. Nicholas was graduated from the University of Texas in 1941 and worked with the Texas Railroad Commission for three months after graduation. Nicholas joined Stanolind at South Houston as an apprentice engineer and in December, 1944, was transferred to High Island. Later he became drilling and development engineer and moved to the company's Gulf Coast division headquarters in Houston.

James W. Nicholas

•

Ionel I. Gardescu, consulting petroleum engineer and geologist, announces the opening of an office at 409 City National Bank Building, Houston.

•

Wayne L. McCann, district engineer in the Shreveport office of Stanolind Oil and Gas Company, has resigned to open an office in Shreveport as a consultant in petroleum engineering and geology. He will specialize in property appraisal, development and operation. McCann has been associated with Stanolind in various engineering capacities in Kansas, Oklahoma and Louisiana since 1942.

Wayne L. McCann

•

George A. Schwab, manager of the Land department for Sunray Oil Corporation, retired June 1 after 25 years as manager of Land department activities. Schwab has a total of 33 years in engineering and Land department service in the industry, having started with Phillips Petroleum Company in 1920. He worked for Waite Phillips Company, later acquired by Barnsdall Oil Company and continued to serve as manager of the Land department when Sunray merged the former Barnsdall Company into the Sunray organization in 1950.

•

W. A. Bramlette of Denver has been appointed assistant chief geologist of The Carter Oil Company with headquarters in Tulsa. **James McCullough,** Vernal, Utah, will replace Bramlette as western division geologist at Denver and **Vernon Farmer** was named district geologist at Vernal. Bramlette began work for Carter in June, 1943, and has done geologic work since that time in Montana, Colorado and the Northwest. McCulloch started his Carter service in Illinois in 1938. Later he transferred to Carter's offices at Billings, Mont., Lander, Wyo., and Vernal.

•

W. R. Yenger has resigned as assistant manager of production, Allied Materials Corporation, and is operating as an independent oil operator at Oklahoma City.

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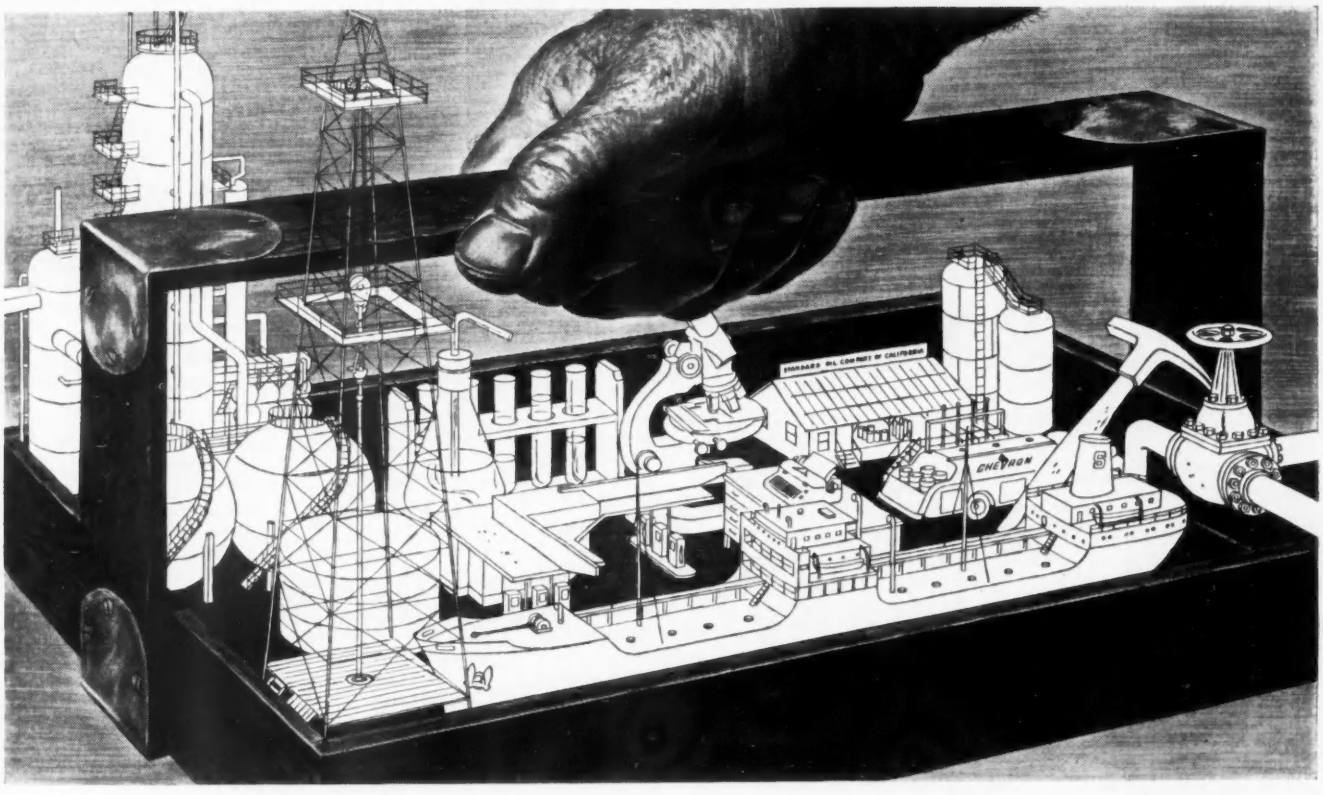

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J. S. Welboan, Jr. has been promoted to assistant division manager in the Geophysical Division, Producing department of The Texas Company, and will continue to be located in the geophysical division Houston office. Joining The Texas Company in 1936, Welboan has had experience in various field parties in the United States and was geophysical supervisor in Fort Worth prior to his promotion in 1951 to assistant to the division manager. **V. E. Child** replaces Welboan as assistant to division manager in the Houston office. Child has been in geophysical work since his graduation in 1936 from the University of California. For the past five years he has been supervisor of field operations on the Houston office staff. Another department change includes **T. L. Kunkel,** supervisor of geophysical operations in the West Texas Division with headquarters in Fort Worth, who is promoted to assistant to division manager and transferred to the Houston office of the Geophysical Division.

•

Russell S. McFarland has been elected president in charge of operations of Seaboard Oil Company of Delaware succeeding **John M. Lovejoy** who assumes the post of chairman of the board of directors and chief executive officer. **James P. Gasser** was elected Seaboard's executive vice president.

•

James R. Cowles, head of corrosion work for Oklahoma Natural Gas Company, has resigned from the company to become a consulting engineer in the field of underground corrosion with office in Tulsa.

•

C. F. Elder, formerly division petroleum engineer for The Texas Company at Tulsa, has been promoted to assistant to the division manager, Oklahoma division, and has been succeeded by **G. M. Bell,** formerly assistant division petroleum engineer.

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Transfers and Promotions

Sinclair Oil and Gas Company changes in the Production department include **Charles C. Leslie,** from Denver City, Texas, to Hobbs, N. M., as warehouseman; **Virgil H. Piccolo,** from Odessa, Texas, to Tulsa as intermediate clerk; **John W. Patterson** from Nowata to Drumright, Okla., as junior petroleum engineer; **David G. McMunn,** from Oklahoma City to Drumright as junior engineer; and **Charles B. Ammann** from Drumright to Oklahoma City as junior engineer.

Changes in Deep Rock Oil Corporation's land and exploration division include the splitting of division operations into a north and south region, each with a separate manager. **Castle J. C. Harvey,** head of Deep Rock's Geophysical department, is named regional exploration manager of the company's south region with area offices in the south region located at San Antonio and Wichita Falls, Texas, and Tulsa. **R. B. Hurlbutt,** assistant to the manager of the Geological department, is appointed regional exploration manager of the north region extending north of the Oklahoma boundary. Area offices in Hurlbutt's region are in Wichita, Kansas, Denver, Colo., and Bismarck, N. D. **Samuel T. Coleman,** manager of the Land department, has been promoted to assistant manager of Deep Rock's land and exploration division and **Dale Benedict,** assistant to the manager of the Land department, is named manager of Deep Rock's Land and Records department.

Magnolia Petroleum Company changes in the producing division include **Keevil L. Brown,** from production foreman to assistant district superintendent of Healdton producing district; **Grayson C. Smith,** senior petroleum engineering assistant in Kermit district, to production foreman in the Healdton, Okla., district; **Frank N. LeDoux,** from rotary driller to marine drilling tools foreman in Louisiana-Gulf division which conducts Magnolia's offshore drilling operations; **Louis M. Ayers,** formerly district superintendent of Louisiana-Gulf district, to the Socony-Vacuum Exploration Company with headquarters at Calgary, Canada; **John H. Brewer,** assistant district superintendent of Brownfield district, to district superintendent of Louisiana-Gulf district; **Cecil M. Rhodes,** from production foreman in Louisiana-Gulf district, to assistant district superintendent in the same district with headquarters at Morgan City, La.; **William Coonan Dougherty,** named assistant superintendent of the Brownfield producing district; **James A. Denney,** named assistant production foreman in the company's Chase district at Great Bend, Kansas; **Nat Coulter,** assistant foreman in the Healdton district, promoted to production foreman at Healdton; **Olvin H. Auld,** named drilling tools foreman of the West Texas division; **J. E. Middleton,** from assistant foreman to production foreman of the Pegasus producing district; **Edward L. Winterbauer, Jr.,** from petroleum engineer to assistant production foreman at Luling district; **Willie Lee Jones,** named assistant production foreman in the Alice district; **James T. Rosenberger,** promoted to assistant district superintendent of the Eldorado, Kansas, producing district; **Harold E. Schwartz, Jr.,** district petroleum engineer of Chase, Kansas, producing district, to senior petroleum engineer in the Kansas division office; and **Charles O. Childress,** petroleum engineer at Houston, to district petroleum engineer in the Chase, Kansas, district with headquarters at Great Bend, Kansas.

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Joe D. Burris, 75, retired oil producer, died at his home in Tulsa June 15. Before becoming an independent oil producer and drilling contractor, Burris worked for the Henry and National Oil Companies until 1923.

•

W. P. Z. German, 76, chief legal counsel for Skelly Oil Company, died June 13. A resident of Tulsa and author of Oklahoma's first oil conservation laws, German helped organize Skelly Oil Company in 1919 and remained as head of the firm's Law department until his death.

•

James G. Sloan, 71, pioneer oil operator, died July 10 in a Tulsa, Okla., hospital. He resided in Monahans, Texas.

•

Clyde C. Callan, 76, a drilling contractor since 1910, died July 11, in a Tulsa hospital. Callan was a native of Findlay, Ohio, and was active in Ohio, Oklahoma and Texas.

•

Dewey K. Chamberlin, 55, of Tulsa, Okla., died July 10 while on a business trip in Minnesota. He was sales manager for the southwestern division of The Pure Oil Company.

•

Marvin Lee, 63, administrative geologist for the Co-operative Refinery Association, died July 11 at Kansas City, Mo. Before going with CRA, Lee was a consulting geologist at Wichita, Kans., and technical advisor to the Kansas Corporation Commission.

W. H. Horner, 83, retired independent oil man, died July 13 at his home in Cleveland, Okla. Horner worked for the old Test Oil Company, prior to becoming an independent operator.

•

John A. Fryer, 64, retired independent oil operator of Tulsa, Okla., died at his home June 25. Fryer served as manager of the Land and Lease department of the Barnsdall Oil Co. and later was in a smilar capacity for the Globe Oil and Refining Company before becoming an independent operator.

•

Sid T. Childress, 65, Houston, vice president and general manager of the Rio Bravo Oil Company, a Southern Pacific affiliate, died June 20 at his home. Childress started his career as a roustabout in the Old Spindletop field near Beaumont, Texas, in 1909.

•

William O. Davidson, 48, Los Angeles oilman, died June 28 in a Santa Barbara hospital. Secretary of the Monterey Oil Co. of Los Angeles, Davidson made his home in Long Beach. He entered the oil business upon his graduation from Stanford University in 1925.

•

William Melvin Bullock, 37, driller for Moran Bros. Inc. at Odessa, Texas, died in a Midland hospital recently from injuries received in an automobile accident near Midland. Also killed in the accident were **James W. Zepfel,** 26, Midland, scout for the Atlantic Oil Company; **Frankie B. Bigham, Jr.,** 32, and **James E. Auten,** 33, of Odessa, roughnecks in a rig crew of Moran Bros. Drilling Company.

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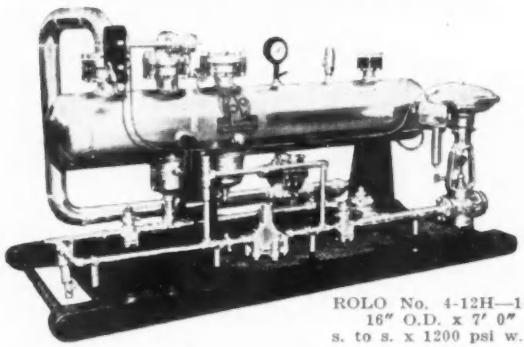

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in equipment and vehicles required for modern exploration, drilling, production, piping and refining of petroleum. Here is a most comprehensive range of sizes, types, capacities and pressures from 0 to 1500, 2000 and 3000 psi together with hydraulic motors, valves and cylinders for developing complete hydraulic circuits. Here is power which combines safety, flexibility, limitless variations and sound economy . . . hydraulic power at its best.

for HANDLING LIQUIDS

Virtually "any substance that will flow through a pipe," including petroleum products from naphthas to crudes and acid sludge, can be efficiently and economically handled in small or bulk quantities by Pumps available from this single source. There are deep and shallow well Centrifugal and Turbine Types, Rotating Plunger and Herringbone Pumps embracing a very broad range of types, sizes and constructions.

for VACUUM PROCESSING

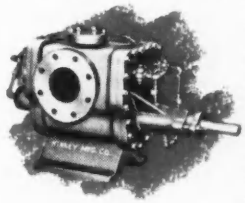
High vacuum pumps for laboratory or high production service in research, vacuum distillation, refrigeration, dehydration, chemical processing, de-aerating, etc.

HYDRECO GEAR TYPE PUMPS

Reversible and non-reversible. Gear type pumps in exclusive FOUR-BOLT design . . . capacities from .5 to 130 gpm and operating pressures to 1500 psi . . . flange or foot mounted . . . furnished with keyed shaft with spline shafts optional. Also dual and tandem models.

KINNEY LIQUID HANDLING PUMPS

A complete range of sizes in Rotating Plunger and Herringbone Gear Pumps to handle light or heavy liquids, sludges, slurries or viscous substances. Available in plain or steam jacketed models and built of special corrosion resistant metals where desired.

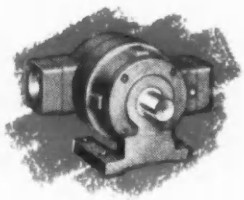


KINNEY VACUUM PUMPS

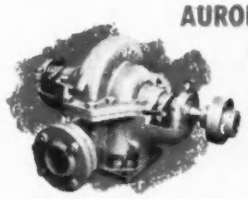
Single stage models to produce absolute pressure readings of 10 microns (.01 mm Hg.) . . . compound pumps producing readings of .2 microns (.0002 mm Hg.) or better. These Kinney High Vacuum Pumps are available in sizes for laboratory as well as high production use.

DUDCO DUAL VANE TYPE PUMPS

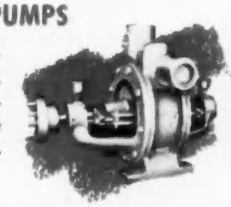
DUDCO Pumps provide a broad range of sizes with capacities to 120 gpm and pressures to 2000 psi. Also available in multiple units operating from a single drive. Hydraulic motors with starting torque outputs to 14,000 lb. in. at 2000 psi.



AURORA CENTRIFUGAL & TURBINE PUMPS

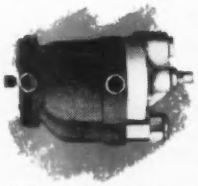


Deep well, sump, drainage and condensation return units, household water systems. Industrial low and high pressure liquid handling pumps. Direct motor and countershaft driven horizontal and vertical models. Capacities 3 to 7500 gpm.



STRATOPOWER PISTON TYPE PUMPS

Axial reciprocating piston type . . . constant or variable delivery with capacities of .25 to 10 gpm at nominal speeds of 1500 rpm with maximum of 4500 rpm . . . working pressures to 3000 psi and 5000 psi . . . direct engine and individual electric motor driven models.



Write—

For detailed information on the type of pump in which you are interested.

THE NEW YORK AIR BRAKE COMPANY

230 PARK AVENUE • NEW YORK 17, N.Y.

THE NEW YORK AIR BRAKE COMPANY

230 Park Ave., Dept. WO, New York 17, N. Y.

Gentlemen: Kindly send additional information on the pumps I have checked.

- ☐ Hydreco Pumps
- ☐ Stratopower Pumps
- ☐ Dudco Pumps
- ☐ Kinney Liquid Handling Pumps
- ☐ Kinney Vacuum Pumps
- ☐ Aurora Pumps

Name .....

Address .....

City ..... State .....

Companies in the News

GREENLAND DRILLING COMPANY has been organized and will operate from 506 Union National Bank Building, Wichita, Kansas. George H. Bunting, Jr., of Kansas City, president and treasurer of the new company, has operated extensively throughout Kansas and Oklahoma for the past 15 years and was one of the original partners in the Nelson Drilling Company, now the Mallard Drilling Company of Wichita. Richard S. Davis of Wichita is executive vice president and secretary of the new firm. Oscar Bridge of Great Bend, Kansas, is vice president in charge of all drilling and field operations.

•

WESTGATE-GREENLAND OIL COMPANY and **WESTGATE DRILLING COMPANY** have transferred executive offices from Kansas City, Mo., to Suite 366, Texas Eastern Building, Shreveport, La.

HOW TO CHOOSE THE RIGHT ANTI-CORROSION LINING

TUBE-KOTE T.M. Reg.

TUBE-KOTE Lining	RESISTS CORROSION	RESISTS ABRASION	RESISTS PARAFFIN ADHERENCE	VALUE FOR USE IN USED PIPE	RESISTS STICKING	RESISTS SCALING
TK-43	very good	very good		very good		
TK-2 CORROSION (Std.)	very good		very good			
TK-2 PARAFFIN (Special)	Not recommended		very good			
TK-88 TEFLON	Not recommended		Not recommended		very good	very good

Answers

TO YOUR CORROSION PROBLEMS!

TK-43: a thick baked-on, rubber-like lining of polyvinyl chloride, centrifugally cast in one coat. **TK-2 CORROSION (Std.):** a 10-coat application of baked-on phenol formaldehyde plastic. **TK-2 PARAFFIN (Special):** a 5-coat application of specially compounded baked-on phenol formaldehyde plastic. **TK-88 TEFLON:** a high-temperature anti-sticking coating material known as polytetrafluorethylene.

Just off the press: New complete data bulletin on TK-43. Write for your copy.

TUBE-KOTE

First Name In Corrosion Resistance

Tube-Kote, Inc.
P. O. Box 20037, Houston 25, Texas

Please send me full details on your products.

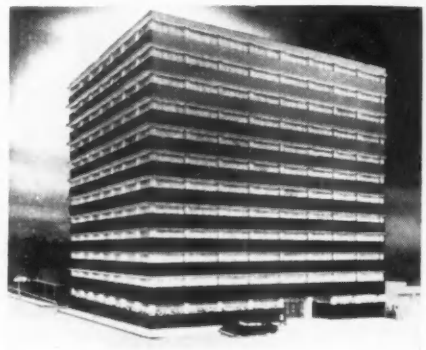
Name_____

Firm_____

Street_____

City_____ State_____

SEND THIS COUPON NOW FOR FULL DETAILS!



New Sunray Oil Building

Construction of a 12-story building of the Sunray Oil Corporation in Tulsa will begin in August. A corporation known as the Ninth and Detroit Building Corporation is being formed to finance the Sunray Building. Sunray will own 50 percent of the building corporation stock. The building will have a 400-seat cafeteria and private club rooms for men and women on the first floor. Completion date is expected to be in late summer of 1954.

•

CITIES SERVICE OIL COMPANY has announced the creation of a Gulf Coast division oil production office at Houston and a new district office at Brownfield, Texas. Headquarters for the Gulf Coast division will be in the Mellie Esperson Building and Brownfield district offices will be in the Cities Service Building. J. P. Straight has been named division superintendent in Houston and E. Y. Wilder will serve in that capacity in Brownfield.

Exhibit Tells Story of Oil Industry

R. W. Pack, Sun Oil Company's director of production, Philadelphia, and W. F. Oxford, Jr., right, head of the Corrosion and Analytical Section, Production lab, Beaumont, Texas, view a working model rotary rig at Sun's new exhibition, "Oil Serves America." The exhibit opened June 12 in Philadelphia's Franklin Institute Museum. This section of the 12-unit exhibit was built in Sun's Beaumont production lab. The exhibit is designed to tell the story of the oil industry and its social and economic significance in terms of everyday living.

You guess . . . we can't!

10 YEARS AGO *THIS FAMILIAR SILHOUETTE ON THE OIL FIELD HORIZON WAS EASILY DISTINGUISHED AS A*

LUFKIN

TODAY . . . *MUCH CLOSER SCRUTINY IS NECESSARY TO IDENTIFY THE MANUFACTURER OF THIS PUMPING UNIT*

DO NOT BE MISLED BY APPEARANCE

SEE OUR CATALOG IN THE COMPOSITE CATALOG

"Look beneath the surface; let not the several quality of a thing nor its worth escape thee"..... *Marcus Arelius*

Lufkin **FOUNDRY & MACHINE COMPANY**

LUFKIN, TEXAS

Branch sales and service Houston, Dallas, New York, Tulsa, Los Angeles, Seminole, Oklahoma City, Corpus Christi, Odessa, Kilgore, Wichita Falls, Casper, Wyoming, Great Bend, Kansas, Effingham, Illinois, Duncan, Oklahoma, Brookhaven, Mississippi

Lufkin Equipment in CANADA is handled by

THE LUFKIN MACHINE CO., LTD., 14321 108th Avenue, Edmonton, Alberta, Canada.

What's Happening

AMONG INDUSTRY ASSOCIATIONS

J. A. LaFortune Named Deputy PAD Administrator

Joseph A. LaFortune of Tulsa has been named deputy administrator of the Petroleum Administration for Defense to succeed J. Ed Warren, who resigned to return to private industry.

A native of South Bend, Ind., LaFortune has been vice chairman of the board of the Warren Petroleum Corporation at Tulsa since 1952. He joined the company in 1924 as secretary and was elected vice president in 1929 and executive vice president several years later. LaFortune obtained his first experience in the petroleum industry when he took a position in the Accounting department of the South Bend office of the Standard Oil Company of Indiana.

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NOW 5 MODELS
Indicating Transmitting Liquid Gravitometer
...for pipelines, gasoline and chemical plants, refineries, etc.
Ruggedly built for hard field use but with laboratory accuracy, the long accepted ARCCO-Anubis Liquid Gravitometer with all its splendid features is now available for recording, controlling, indicating, transmitting, or various combinations of these functions. Write us fully about your application and request Bulletin No. 111 Revised.
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Philip Humphrey Joins OIIC Of API As Deputy Director

Philip C. Humphrey has joined the staff of the Oil Industry Information Committee of the American Petroleum Institute. His appointment as deputy director was announced by Executive Director H. B. Miller.

Philip C. Humphrey

Humphrey came to the OIIC from The Texas Company, where he had been manager of public relations for the past 11 years. He has been identified with the Oil Industry Information Committee program since its inception in 1947, and has served three terms as a vice chairman of the national group. In his new post, Humphrey will be in direct charge of all creative work.

Houston Geologists Elect Wayne Burkhead President

The Houston Geological Society has elected Wayne Burkhead, Union Oil Company of California, as president. Others named to office are Tom D. Hedley, British-American Oil Producing Company, first vice president; David B. Remick, Pan American Production Company, second vice president; J. L. P. Campbell, Lane-Wells, secretary; and Michael B. Morris, Continental Oil Company, treasurer.

New members of the advisory committee are Hilliard Hinson, consultant; Richard Holland, J. S. Abercrombie Oil Company; and Fred L. Smith, Jr., consultant. Membership in the group now numbers approximately 950.

Due to the transfer of Morris from the Houston area, John A. High, Gulf Oil Corporation, has been appointed treasurer.

Corporate Secretaries Announce New Officers

Laban E. Harmon, Chicago, Ill., secretary of Standard Oil Company (Indiana), has been elected president of the American Society of Corporate Secretaries, Inc. Harman, a vice president, director and founding member of the society and former president of its Chicago regional groups, succeeds John H. Mathis of New York, vice president and secretary of Lone Star Cement Corporation.

Vice presidents are Lammot du P. Copeland, secretary, E. I. du Pont de Nemours & Company, Inc., Wilmington, Del.; George L. Harding, secretary and treasurer, Pacific Telephone and Telegraph Company, San Francisco, Calif.; and George K. McKenzie, vice president and secretary, Flintkote Company, New York. Loren R. Dodson, secretary and treasurer of Continental Can Company, New York, was elected secretary, and John B. Noone, secretary-assistant treasurer of Standard Brands, Inc., New York, was named treasurer.

TD-14A SCOOPS 'EM OUT NEAR BLEDSOE, Texas, scoops up a profit fast for oil field contractor.

How to Push Out Pits *in Record Time!*

"TD-14A has Power and Speed for Fast Production," says Texas Contractor

A rugged International TD-14A dozes out a set of pits in 3½ hours for Fletcher B. Lewis of Levelland, Texas.

That's why Lewis has been using Internationals for oil field dozer work, soil conservation, and general excavating since 1941. Here's the way Lewis puts it:

"With the high-speed reverse my operators push out a set of pits in record time. Faster production means more money to me, in less time. My tractors work hard, and I keep them on the go because I don't need special permits to transport them."

If *you* want to push up profits as you push out pits, the big red crawlers are for you. See your International Industrial Distributor for the facts about "Power That Pays."

INTERNATIONAL HARVESTER COMPANY · CHICAGO 1, ILLINOIS

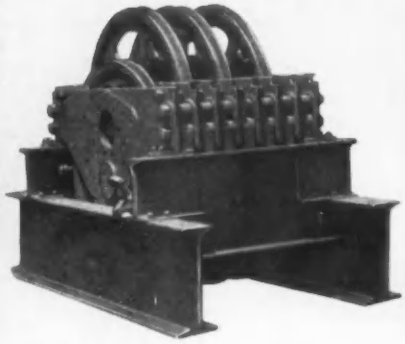
OPERATOR JAMES SNOW AND OWNER F. B. LEWIS with a power-packed TD-14A that puts in 8 to 10 tough hours a day in the Texas fields.

INTERNATIONAL INTERNATIONAL HARVESTER **POWER THAT PAYS**

STANDARD
OF THE
PETROLEUM INDUSTRY
Since 1905

Committee Plans AGA Meeting

The Corporate Secretaries Committee of the American Gas Association shown making plans for their portion of the AGA meeting to be held in St. Louis, Mo., October 26-29 are, left to right, B. H. Harper, Northern Natural Gas Company, Omaha, Neb.; Tom H. Wheat, Transcontinental Gas Pipe Line Corporation, Houston, Texas; Kurwin R. Boyes, secretary of American Gas Association, New York City; Dale Parker, The Columbia Gas System, Inc., chairman of the committee, New York; R. M. Drevs., The Peoples Gas, Light and Coke Company, Chicago; and Ray L. Thomas, Colorado Interstate Gas Company, Colorado Springs, Colo.



Regan *type* **AN55**
CROWN BLOCK

...built to stand up under the line speeds and loads applied by the largest drilling rigs. Ball bearings have been used to carry the thrust loads and further reduce the side drag on the sheaves. Heavy roller bearings carry the radial loads. The basic Regan design of a rotating inner race ring has been kept but the inner race ring of the roller bearings is mounted on the sheave hub. A bolt through the sheave hub pre-loads the ball thrust bearings and removes all side play from the sheaves. Positive lubrication to each bearing. Capacity—600 tons.
Write for informative bulletin.

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Regan
Forge & Engineering Co.
SAN PEDRO, CALIF.
FORT WORTH, TEXAS
Exclusive Mid-Continent and Export Distributor:
MID-CONTINENT SUPPLY CO.
General Offices: Fort Worth, Texas
Quality - Wrought on the Forge of Experience

Davis D. Bovaird

Rodney S. Durkee

Bovaird Named President Of Suppliers Association

Davis D. Bovaird, Bovaird Supply Company, Tulsa, was elected president of the Petroleum Equipment Suppliers Association at the 18th annual meeting in Colorado Springs. He succeeds Mason B. Jones, The S. M. Jones Company, Toledo. Rodney S. Durkee, Lane-Wells Company, Los Angeles, was elected vice president.

The following were elected members of the Board of Directors for the coming year:

Eastern District: Mason B. Jones, The S. M. Jones Co., Toledo, director-at-large; Karl Elliott, Acme Fishing Tool Co., Parkersburg, W. Va.; Jene Harper, Franklin Supply, Chicago; Lloyd Lanphere, Ajax Iron Works, Corry, Pa.; A. S. Knowles, Parkersburg Rig & Reel; Donald Mackie, Jr., Bradford Supply, Bradford, Pa; Frederick W. Murray, Oil Well Supply, Dallas; A. W. McKinney, National Supply, Pittsburgh; J. B. O'Connor, Dresser, Dallas; Paul Scherf, Olens Foundry & Machine, Lancaster, Ohio; F. J. Spang, Spang & Co., Butler, Pa.; H. Bernard Wehrle, McJunkin Corp., Charleston, W. Va.

Mid-Continent and Rocky Mountain District: Guy A. Tompson, Bethlehem Supply, Tulsa; Frank E. Bernsen, Lucey Products Corp., Tulsa; E. C. Bolger, W. C. Norris Co., Tulsa; D. D. Bovaird, Bovaird Supply, Tulsa; Rainey Elliott, J & L Steel, Tulsa; Grover Kilgore, Halliburton, Duncan, Okla.; W. H. Larkin, Larkin Packer Co., St. Louis; M. G. McCool, American Iron & Machine Works, Okla. City; Walter O'Bannon, Walter O'Bannon Co., Tulsa; John G. Staudt, Dowell, Inc., Tulsa; S. P. Wallace, Maloney-Crawford Tank Co., Tulsa; J. E. Webb, Republic Supply, Okla. City; Carl White, Jr., Franks Mfg. Co., Tulsa.

Southwestern District: Wallace D. Wilson, Wilson Supply Co., Houston; and Fred M. Mayer, Continental Supply.

Dallas, Directors-at-Large: W. T. Campbell, Mission Mfg. Co., Houston; H. E. Chiles, The Western Co., Midland; Ken. W. Davis, Mid-Continent Supply, Fort Worth; R. G. Hamaker, Reed Roller Bit, Houston; H. A. Helms, Cameron Iron Works, Houston; Frank L. Hereford, Murray-Brooks, Inc., Lake Charles, La.; S. J. Iverson, Iverson Supply, Fort Worth; Elliott Johnson, Schlumberger, Houston; L. A. Little, Lufkin Foundry & Machine Co., Lufkin, Texas; M. E. Montroe, Hughes Tool, Houston; George O'Leary, Houston Oil Field Material, Houston; Ray O. Shaffer, Welex Jet Services, Fort Worth.

Pacific District: D. S. Faulkner, National Supply, Torrance, Director Emeritus; J. A. Crawford, Youngstown Steel, and E. S. Dulin, Byron Jackson Co., named directors-at-large; Markley C. Brown, Hillman-Kelley; Rodney S. Durkee, Lane-Wells; J. L. Evans, National Supply Co.; W. W. Greenway, Axelson Mfg. Co.; Don Grubbs, Oil Well Supply; H. J. Hagn, Chiksan Co.; Otto Hammer, Security Engineering; Harold E. Howard, Howard Supply; Wendell Jones, Bethlehem Supply; John J. Pike, Republic Supply of Calif.; W. T. Powell, Emsco; Ted Sutter, Baker Oil Tools.

NACE Plans Corrosion Tour For September 30-October 2

Permian Basin Section of the National Association of Corrosion Engineers will hold its fourth corrosion tour September 30-October 2. The sessions include visits to equipment in the field for inspection of effectiveness of corrosion mitigation efforts, followed by discussion sessions.

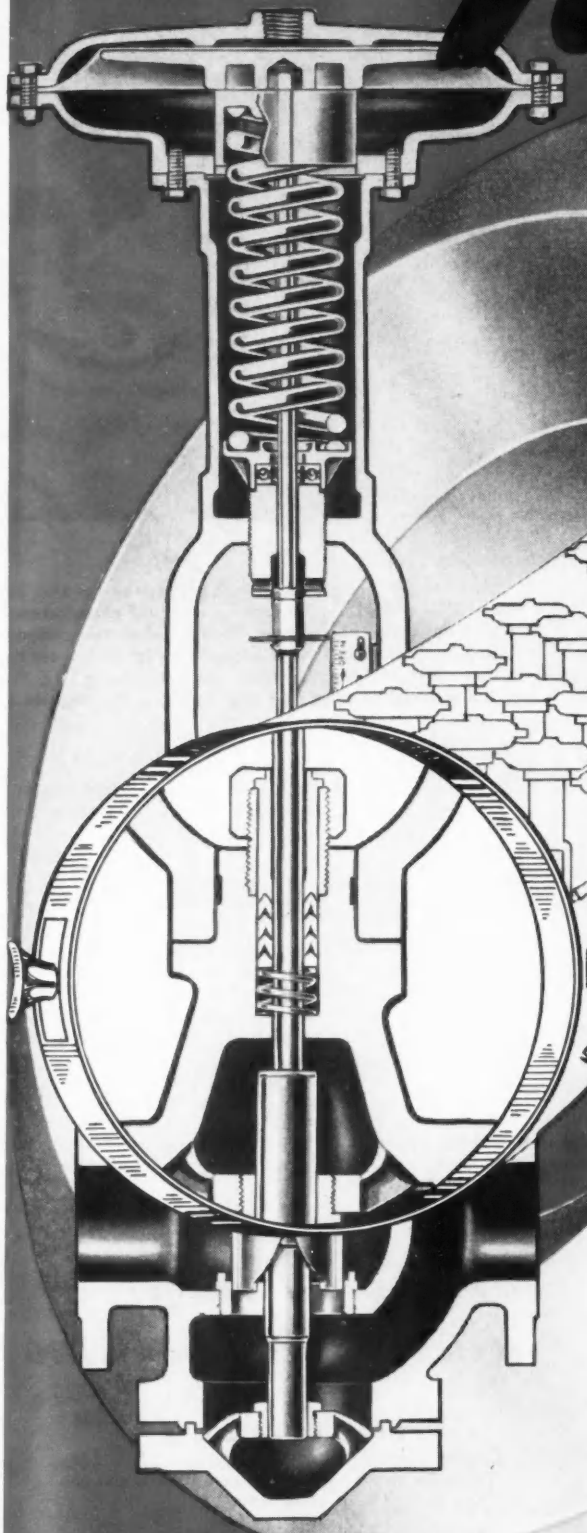
As far as possible the same equipment inspected in 1951 will be viewed again in order that effectiveness of control measures can be weighed. Persons attending the tour get an opportunity to inspect coatings applied to interiors and exteriors of petroleum production and storage equipment and other corrosion control installations in the Permian Basin area.

Those interested may get additional information by writing John A. Knox, secretary-treasurer Permian Basin Section NACE, Box 310, Midland, Texas. It is not necessary to be a member of NACE to attend the tour.

FISHER®

Teflon*

V-RING PACKING



. . . LEADING THE MARCH TO BETTER DIAPHRAGM MOTOR VALVE PERFORMANCE

Proved by many months of field service, Fisher Teflon V-Ring Packing features:

- ***No gland leakage.***
- ***Used on wide range of pressures without appreciable change in friction values.***
- ***Elimination of maintenance and adjustment.***
- ***No valve stem lubricators required.***
- ***Chemically inert to all fluids up to 450° F.***

Fisher Teflon V-Ring Packing is now standard equipment on all Fisher Diaphragm Motor Valves.

Bulletin E-200 gives complete details.

*Teflon is the trade name of E. I. Du Pont de Nemours & Co.

FISHER GOVERNOR COMPANY

MARSHALLTOWN, IOWA

What's Happening

AMONG SERVICE AND SUPPLY MEN

Reed Roller Bit Plant Completes New Addition

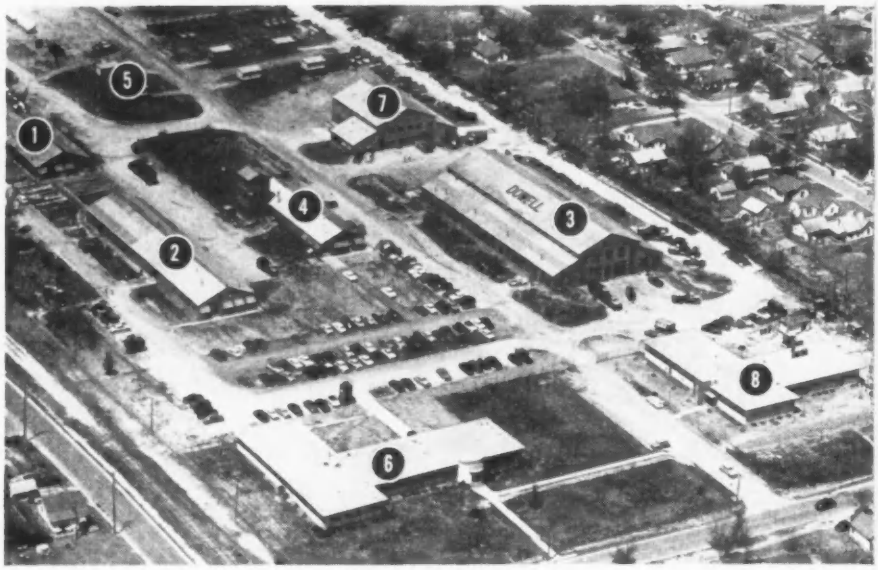
A 43,000-square foot addition to Reed Roller Bit Company's Houston plant has recently been completed. The new shop will flash weld tool joints to drill pipe, latest addition to Reed's line of oil tools.

After extensive research, Reed engineers and technicians have perfected their process for flash welding tool joints to drill pipe. More than 50 division managers and salesmen of the company were in Houston recently for a three-day meeting to inspect the new plant and watch it in operation.

The pipe handling equipment in the new Reed shop is fully automatic. This system collects and feeds drill pipe into the welding machine.

Fort Worth National Sells Additional Stock

Stockholders of The Fort Worth National Bank have approved a $2 million increase of the bank's capital accounts through the sale of additional common stock. The bank's capital and surplus accounts each will be increased from $6 million to $7 million to provide a total capital and surplus of $14 million. The bank's capital account, including undivided profits, would then be approximately $15 million.



Dowell Incorporated Installations Grow

An air view shows the location of the various Dowell Incorporated installations on the 20-acre site in Tulsa. Construction was begun in 1944 when Dowell moved its chemical manufacturing facilities to the structures labeled (1) and (2) in the photograph. Early in 1945 the company consolidated its Midland and Bay City, Mich., equipment assembly shops (3). Also shown are the engineering development laboratory (4), the office building (6), and parts warehouse (7). The new chemical research center (8) is now being occupied. The spot marked (5) is the location of a new test well to be drilled soon.

BJ Service Appoints Smith Sales Manager

Frank D. Smith has been appointed sales manager for the BJ Service, Inc. Pacific Coast, Rocky Mountain and Texas divisions.

Smith joined International Cementers Incorporated, a parent company of BJ Service, Inc., in September, 1943 as Pacific Coast division sales engineer. He became division manager in charge of operations in 1945 and was elected vice president in 1950.

New appointments announced by Smith are C. F. McMahan, assistant sales manager; James T. Streger, Pacific Coast division sales supervisor; J. D. (Jerry) Ormand, West Texas division sales supervisor, and Orrie O. Luttrell, Rocky Mountain division sales supervisor.

Rust-Oleum Corporation Adds Two Industrial Distributors

The Rust-Oleum Corporation, Evanston, Ill., manufacturers of rust-preventives for more than 25 years, announces the addition of two new industrial distributors to its nation-wide distributor sales organization.

Newly appointed distributor firms are Griswold-Sohl Automotive Company, 232 North Fourth Street, Columbus 15, Ohio; and Mill Supplies, Incorporated, Box 2762, Highway 82, East, Greenville, Miss.

Ask for your copy of the New Petroleum

BOOK CATALOG

The Book Department of Gulf Publishing Company now has available—free on request—a new Catalog of Petroleum BOOKS published by the company or available for ordering thru the Book Department.

The catalog gives descriptions, subject material and prices on over 125 currently available books written by authorities on nearly every phase of petroleum and related industries. Whether you are interested in completing a technical library or interested only in a single volume that may be of practical job-interest value, you should find this new Book Catalog of interest.

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In GRAND PRAIRIE
Lennox Hotel
N.W. 2nd & Main Sts.

In FORT WORTH
Loring Hotel
Camp Bowie Blvd. & University Dr.

Come as you are . . . . . .

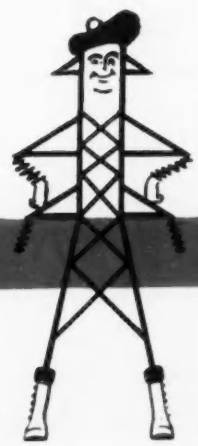
Our Silver Anniversary

Climaxing 25 Successful Years of Partnership with You

Yes . . . we are celebrating the Silver Anniversary of our partnership with you of the petroleum industry. To our way of thinking, it has been a valuable twenty-five years for you as well as us . . . and we are proud to have been able to bring LOW-COST ELECTRICAL POWER to so many organizations in all phases of the petroleum industry. Oil men everywhere are invited to attend our Silver Anniversary meeting at Hotel Muehlebach in Kansas City, Mo., October 5, 6 and 7. Come and bring your power problems with you . . . because this is a meeting not for appraisal of past accomplishments but for planning more and better ways of providing the petroleum industry with EFFICIENT LOW-COST ELECTRICAL POWER. See you in Kansas City.

Welcome

- OIL MEN
- EQUIPMENT MANUFACTURERS
- ALLIED SUPPLIERS
- OIL JOURNALS and PRESS



Petroleum Electric Power Association

ORGANIZED IN 1928 IN THE INTEREST OF
GREATER SERVICE TO THE PETROLEUM INDUSTRY

George W. Davis, Jr. William J. Crouch

Davis and Crouch Join Chemical Laboratories

George W. Davis, Jr. and William J. Crouch recently joined the engineering division of Chemical and Geological Laboratories in Casper, Wyo. Davis, a graduate of The University of Texas in petroleum engineering, has been named manager of the Engineering department. Formerly he was with the Engineering department of Stanolind Oil & Gas Company in Texas and Wyoming.

Crouch, a graduate of Tulsa University, has been associated with Amerada Petroleum Corporation in Casper.

Foster Cathead Names Gulf Coast Representative

Foster Cathead Company, Wichita Falls, Texas, has announced the appointment of Marvin Peck of Peck Sales & Service, 5822 Harvey Wilson Drive, Houston, as their factory representative for the Houston-Gulf Coast area. The appointment was effective June 1, 1953.

T. D. Williamson Appoints Service Representative

T. D. Williamson, Inc., Tulsa, has announced the appointment of Tod Pazdral as exclusive sales and service representative for south and east Texas and Louisiana. Pazdral's 25 years in the pipe line industry includes nine years experience with application and use of Williamson pigs, WmSON-Hillco tapping machines, WmSEAL casing bushings and concentric-support insulators. Pazdral is also president of Pazdral and Whitaker Construction Company.

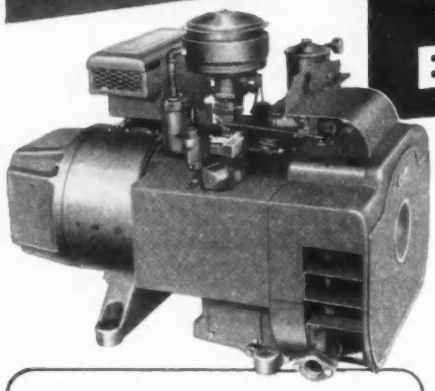
As agent for Williamson, Pazdral will be assisted by James H. McBrien who has completed 18 months field experience with all Williamson products in pipe line and refinery applications throughout the U. S. and Canada. Previously, he was corrosion engineer for Great Lakes Pipe Line Co. following graduation from the University of Arkansas and two years in the Navy. Pazdral's offices are in the Ahrens Building, 5727 Kirby Drive, Houston.

Peabody Appoints Peterson Executive Vice President

Dr. Ernest H. Peabody, founder and President of Peabody Engineering Corporation, New York, N. Y., has announced the appointment of Eric G. Peterson to executive vice president. The appointment was made by the board of directors following the stockholders' meeting.

Peterson, graduate of Stevens Institute of Technology, has been with Peabody Engineering since 1928. His new assignment now embraces all phases of research and engineering, production and sales.

The STANDOUT ELECTRIC PLANT
for STANDBY ELECTRIC POWER



the New ONAN "CW"
5000, AND 10,000 WATTS

★ COMPACT—Requires less than one cubic yard of space. 10KW model needs only half the space of other 10KW units.
★ BUILT FOR HEAVY DUTY—Twin-cylinder, horizontally-opposed, 4-cycle, air-cooled engines operate at moderate speed.
★ UNI-DUCT COOLING—Air cools both engine and generator and is expelled through one small vent which also discharges engine exhaust.

Here's a powerhouse of emergency electricity with features and performance that make it a standout!

The CW is compact and lightweight. It's easier to install and requires a minimum of servicing. Air-cooling avoids trouble from leaking or freezing.

New vacuum cooling and the smooth-running, 4-cycle, twin-cylinder engine give the CW amazing quietness. All moving or heated parts are safely enclosed.

The Onan CW, with all its exclusive advantages, *costs less than any other complete electric plant of its capacity.*

DeLuxe equipment. Nothing extra to buy.

WRITE FOR SPECIFICATIONS

Onan ELECTRIC PLANTS
D. W. ONAN & SONS INC.
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Alten Foundry and Machine Names New Sales Manager

Alten Foundry and Machine Works, Inc., Lancaster, Ohio, has announced the appointment of R. R. (Lefty) Matthews as sales manager of the Oilfield Division.

R. R. Matthews

A petroleum engineering graduate of the University of Oklahoma, Matthews started his business career with Lucey Products Company in 1933 and in 1935 he joined the Republic Supply Company in Kansas. During the past 15 years, he has held various executive capacities with the Ideco Division, advancing to manager of pumping unit sales, a post he relinquished when the Ideco Pumping Unit Section was purchased by Alten. Matthews will make his headquarters in Tulsa.

Industrial Chemical Service Opens Station in Oregon

John B. Merritt, executive vice-president of BJ Service, Inc., and Industrial Chemical Service Co., recently announced the opening of an Industrial Chemical Service station at Portland, Oregon. The Industrial Chemical Service Co. is a wholly owned subsidiary of BJ Service, Inc.

At the same time, Merritt announced that Keith J. Swift, fieldman, was transferred from the Oakland, Calif., station to take charge of the new Portland station. W. H. Atkins, sales engineer at Oakland, was transferred from the Oakland, Calif., station to Long Beach, Calif., to replace R. L. Johnston, who was recently reassigned to the Glendive, Mont., station, Rocky Mountain Division of BJ Service, Inc. Replacing Atkins at Oakland is A. M. Marzolla, a former employe now again with the Company.

The new station, Merritt stated, will offer chemical cleaning and maintenance service to industry throughout the Oregon area, including fast, economical, safe removal of water-deposited scales and sludges from all types of equipment.

Perrault Equipment Company Announces New Appointment

Fred Vallejo, formerly with the Bechtel Corporation in San Francisco, has joined Perrault Equipment Company in the Sales Division. Vallejo has been in the pipe line business since 1949. In addition to working for Bechtel, Vallejo was in sales work for the Friedman Equipment Company in Bridgeport, Conn. His work for Perrault, suppliers of equipment and materials for pipe line contractors, will cover West Texas, northern Oklahoma, Colorado, Nebraska, Kansas and Missouri.

Fred Vallejo

Want Production from sandy holes?...

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Pacific

TYPE "M"

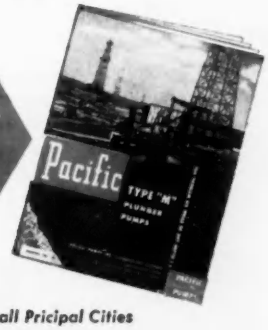
PLUNGER PUMPS

WITH PATENTED* TOP LOCK AND VALVELESS PLUNGER

Now you can use a "macaroni string" pumping installation without hollow sucker rods in problem wells of any depth. With the new Pacific Type "M" insert oil well pump, sand and abrasives *are sealed out above the pump end* by means of a fluid well; thus plunger and liners are fully protected. With the valveless plunger assembly the plunger acts as a "macaroni string" in the pump and the tubing *above* the seal functions as a "macaroni string" *above* the pump. Pacific Type "M" Plunger Pumps meet all API standards.

*PATENT NUMBER 2509223

Send for New Bulletin 120...



Pacific Pumps inc.

ONE OF THE DRESSER INDUSTRIES

HUNTINGTON PARK, CALIFORNIA
Export Office: Chanin Bldg., 122 E. 42nd St., New York—*Offices in all Pricipal Cities*
MID-CONTINENT DIVISION: 1221 E. 1st St., Tulsa, Oklahoma
DISTRIBUTED IN CANADA BY: Lucey Export (Canada) Ltd., 1215 9th Ave., Calgary

DW-9

Forster Named President Of Hercules Powder Company

Albert E. Forster was elected president of Hercules Powder Company and chairman of the executive committee recently. Forster succeeds Charles A. Higgins, president and chairman of the board, who resigned after serving as president since 1939. Higgins also resigned the chairmanship of the company's executive committee but will continue as chairman of the board.

Forster has served as vice president and member of the executive committee since 1951. He was elected a director of the company in 1940. Forster joined Hercules in 1925, leaving the company in 1930 for engineering practice in Brazil. He rejoined Hercules in 1934 as a member of the Explosives department.

Higgins, who was born and educated in England, came to the U. S. in 1915 as chief chemist with Union Powder Company of Parlin, N. J., later purchased by Hercules Powder Company. After a series of promotions Higgins became vice president and chairman of the finance committee. In 1939 Higgins was named president.

Cardwell Moves New York Office

The Cardwell Manufacturing Company, Inc., has changed the location of its New York office. The new address is 277 Park Avenue, New York 17, New York. W. E. Volkman, assistant export manager, is in charge of the New York office.

Jarvis Named Sales Manager Of Texas Tool and Machine

Robert Jarvis has recently been appointed general sales manager of Texas Tool & Machine Company, Houston. A graduate of U. C. L. A., Jarvis worked in tool design and plant engineering and traveled in the United States as a sales engineer. As a tool design engineer Jarvis designed and patented several specialized tools still being used by the armed services. Jarvis has returned recently from Venezuela where he owned and operated an oil well service company.

Robert Jarvis

Two New Appointments Made by Oil Well Supply

Two appointments in the Ohio-West Virginia district have been announced by C. H. Maynard, area manager for the Oil Well Supply Division of United States Steel.

James A. Durham, formerly manager of the "Oilwell" store at Charleston, W. Va., has been appointed district representative, refinery and pipe line sales and will headquarter at Charleston. Succeeding Durham as Charleston store manager will be Carl R. Nelson, who has worked in the store since 1951.

Durham, born and reared in Kentucky, joined "Oilwell" June 1, 1941. Nelson was born and reared in Bradford, Pa., started work for "Oilwell" in August, 1941.

Cooper-Bessemer Warehouse Opened in Edmonton, Canada

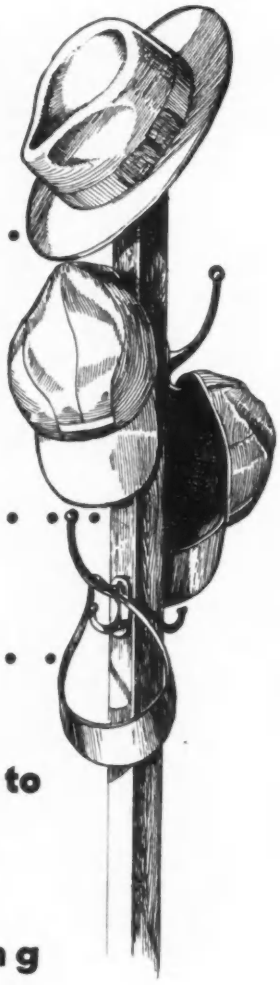
Cooper-Bessemer of Canada Limited recently opened its newest branch office and parts warehouse in Edmonton, Canada. Under the direction of Edward D. Van Fossen, this latest addition to Cooper-Bessemer's world-wide sales and service facilities is planned to provide prompt factory service on parts for Cooper-Bessemer's diesel, gas-diesel and gas engines as well as for its gas engine-driven compressors.

Edward D. Van Fossen

Heading a factory-trained service staff at the Edmonton warehouse is Al Rothenbuhler, serviceman at Cooper-Bessemer's warehouse in Great Falls, Mont., since 1949. Assisting Rothenbuhler is William Munro, warehouseman who was formerly with the British Columbia Power Commission.

Van Fossen, in charge of this sales office and parts warehouse, comes from Cooper-Bessemer's district office in Seattle, Wash. A factory-trained field engineer, with a mechanical engineering degree from the University of Washington, Van Fossen has extensive experience in the many phases of power generation and compressor operation serving the Canadian sector.

Abrams



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Technicians . . . . . .

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ABRAMS AERIAL SURVEY CORPORATION
LANSING 1 MICHIGAN, U.S.A.

Logan D. Campbell

L. B. Meaders

Executive Personnel Changes Announced by Halliburton

Changes in top executive personnel of Halliburton Oil Well Cementing Co. have been announced by Erle P. Halliburton, chairman and founder. Logan D. Campbell, vice president and secretary-treasurer, assumes the newly-created post of vice-chairman of the company. Campbell also was reelected as director.

L. B. (Preach) Meaders, vice president for field operations, succeeds W. R. McClendon, who retired as president after 30 years association with Halliburton. Meaders was elected a director.

Taking over Meaders' former post is R. G. Kelly, a regional vice president. Marvin Brummett, assistant general counsel of the company since 1947, was named secretary and H. H. (Spike) Leonard was made treasurer and assistant secretary. The one new vice president named was D. R. Yager, manager of Halliburton's Oklahoma division.

All other officers were reelected. These include Harry P. Conroy and Fred R. Whitten, regional vice president; Ralph R. Emery, vice president—foreign operations and export sales; J. Grover Kilgore, vice president—sales and advertising; W. D. Owsley, vice president—engineering advice to management; Wilfred Tapper, vice president—electrical well services; John P. Harbin, assistant secretary and G. D. McEnroe, assistant treasurer.

Lee C. Moore Appoints Campbell Division Engineer

E. A. Campbell has been appointed eastern division engineer of the Lee C. Moore Corporation, and will be in charge of the Oil Industry Engineering department of the Pittsburgh plant.

Campbell joined Lee C. Moore Corporation Production department in 1933 and from 1945 until the present time has been in the company's Pittsburgh Engineering department. He is a registered engineer, State of Pennsylvania, and a member of the Pennsylvania Society of Professional Engineers, Pittsburgh Chapter.

Pipelife Forms Company In Louisiana-Arkansas

Pipelife, Inc., of Odessa, Texas, originators of the Pipelife process, announces formation of Internal Pipeline Maintenance Co. of Louisiana and Arkansas at Shreveport, La. The Pipelife process is a patented means of cleaning and plastic-coating oil, water, gas and product pipelines internally, in place, without raising lines or dislocating them.

Officials of the new Internal Pipeline Maintenance Co. of Louisiana and Arkansas are Alfred Curtis, A. T. "Buzz" Moseley, and J. T. and C. H. Owens.

Curtis is a veteran pipeliner, having spent 15 years in maintenance and construction with Humble Pipeline Co., and 13 years with other pipeline contractors until recently when he entered business for himself. Curtis was an early contributor to the development of the Pipelife process.

Moseley has a background of 25 years of sales experience in West Texas and has been indirectly associated with Pipelife for approximately two years.

J. T. Owens spent 20 years in the wholesale oil and gas business with Gulf before going to Odessa in 1937 to open the Odessa branch for Phillips.

His brother, C. H. Owens, has a long-time association with the oil and pipeline industries and dates his experience with independent drilling contractors to the days of steam rigs.

International Harvester Promotes Harald T. Reishus

Harald T. Reishus, who has been general manager of the Industrial Power Division of International Harvester Company since its formation in 1944, has been elected vice president in charge of the division.

Reishus joined the company in 1923 and advanced through various managerial positions in the farm equipment and motor truck division. In 1941 he was appointed eastern regional manager of general sales. In 1942 was assigned to the War Materials department.

In 1943 he was named assistant domestic sales manager of industrial equipment, and in 1944 became general manager of the Industrial Power Division.

YOUR U. S. A.

We complain constantly about the way things are being done in this country, but we seldom complain to the right people.

If we don't like the way our affairs are being managed at the local, state or national level; if we think America is being played for a sucker at the international poker table, or sold down the river at the U.N.; if our taxes are too high; our liberties in danger; we can promptly call to account those we have elected to look after such matters. How? By writing them and stating in no uncertain terms what we expect of them.

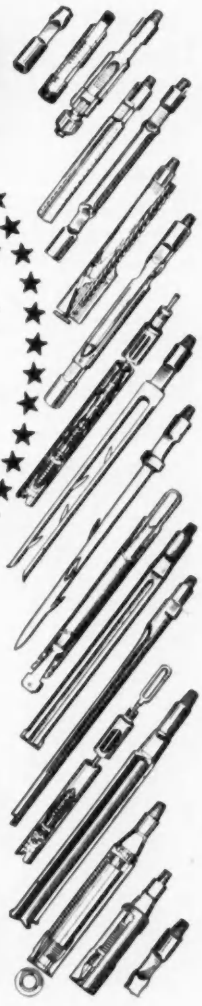
Will it work? You bet it will—especially if we back it up with our votes at election time.

SPANG PROSSER-TYPE SWIVEL ROPE SOCKET

The Prosser-Type Swivel Rope Socket is typical of the many ruggedly efficient Spang Cable Tools that are known and preferred throughout the world.

Made of a grade and type of steel particularly suited to this product, it is first semi-finished and bored. It is then heat-treated to give it a uniform toughness and the proper hardness both inside and out. Finally, it is finished turned, the tool joint threaded and the side holes drilled.

The result—a swivel rope socket of superior quality, delivering maximum service for safe, efficient drilling.



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The HIGHER STANDARD for SPANG CABLE TOOLS made by SPANG & CO., BUTLER, PA.

OIL WELLS • GAS WELLS • ARTESIAN WELLS
SHOT BLAST HOLES • PROSPECT DRILLING

SPECIFY SPANG—FOR SALE BY DEALERS EVERYWHERE

CUT STUCK SAND LINES IN THE WELL

KINLEY SAND LINE CUTTER

M. M. Kinley Company Licensees

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HOBBS
Horne Well Service Co. - - - - - - - 3-5396
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Adair Service Co. - - - - WE-6497, PR-4652
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MIDLAND
Luccous - - - - - - - - - - 4-8471, 4-4320
NEW IBERIA
Tuboscope - - - - - - - - - - 1411, 3210-W
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ALL of your Sub Requirements

BEMCO Rotary Substitutes are made of the finest alloy steels, carefully threaded and finished to A.P.I. specifications. All types and sizes are furnished and are usually available for immediate delivery out of stock.

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John A. Borman

Russell Hastings

2 Lift-Truck Engineers Join Clark Equipment Company Staff

Two prominent lift-truck engineers have joined the Clark Equipment Company's Industrial Truck division. John A. Borman, who was with Clark from 1946 to 1950 before joining Baker-Raulang Company, has returned as assistant to Vice President Robert H. Davies on engineering and production problems.

Russell Hastings, who spent 18 years with Lewis-Shepard Company, is the new assistant to A. O. Williams in directing the activities of the Clark engineering staff.

Borman is a 1943 graduate of Ohio State University with a B.S. degree in industrial engineering. Hastings attended Phillips Exeter Academy and was graduated from Massachusetts Institute of Technology with a degree in business and engineering administration.

Colorado Fuel and Iron Announces Appointments

Frank F. Argust has been appointed superintendent of industrial engineering of the Colorado Fuel and Iron Corporation. Other appointments announced are Dean B. Valentine, assistant superintendent of industrial engineering, and Morton E. Weichsel, manager of industrial engineering.

Argust joined the company in 1940 as junior industrial engineer. Later he joined Lockheed Aircraft Corporation and Crown-Zellerbach Corporation and established his own office as counselling engineer in Los Angeles. In 1950 Argust returned to Colorado Fuel and Iron as senior industrial engineer.

Valentine, a graduate of the University of Colorado School of Engineering, came to the company in 1941 as junior industrial engineer. He advanced to industrial engineer and senior industrial engineer in 1947.

Weichsel has been with the firm since 1925 and has served as superintendent of industrial engineering at the Minnequa works since 1947.

Baash-Ross Transfers Wallace to Kansas Area

Baash-Ross Tool Company has transferred W. H. (Bill) Wallace to the Kansas area to handle sales activities in that area. Wallace has been with Baash-Ross in its Mid-Continent operations for five years and has had extensive experience in the oil tool industry, both in field and shop operations as well as in sales activities.

Wallace will make his headquarters in Great Bend, Kansas, from which point he will cover the principal oil territories of Kansas.

Charles Howell Receives General Motors Appointment

Detroit Diesel Engine Division of General Motors has announced the appointment of Charles Howell as assistant to A. F. Campbell, the division's manager of engine sales to the petroleum industry in Tulsa, Okla.

Charles Howell

Howell joined Detroit Diesel in 1948 and prior to his present assignment served as factory sales engineer to the division's West Coast distributors. He succeeds E. J. vanDyk, who is being transferred to the home office in Detroit as an engineering consultant to the Sales department.

Le Roi Company Adds Shanahan To Field Engineering Staff

Frank Shanahan has joined Le Roi Company's field engineering staff. Prior to joining Le Roi, Shanahan was chief test engineer of the A. O. Smith L. P. G. Carburetion Division. He has also been associated with the Shell Oil Company, the Chrysler Corporation, the Ford Motor Company and Hudson Motor Car Company.

Shanahan's field work for Le Roi will be primarily concerned with Le Roi's line of high powered V-8 transportation engines and heavy duty irrigation and oil well drilling engines.

Iverson Supply Company Announces Personnel Changes

Iverson Supply Company has announced the following changes in personnel: Hugo Zimmer, formerly manager of the Salem, Ill. store, transferred to Farmington, N. M. as a field salesman.

Ernest Lambert, formerly store manager at Price, Utah, transferred to Farmington, N. M., where he will serve as store manager.

Al Iverson, Jr., formerly field salesman, has assumed the management of the store at Price, Utah.

John Spain, formerly store man at Salem, Ill., transferred to Farmington, N. M., where he will serve in the same capacity.

Pat A. Knieff has joined the Iverson organization as city salesman in the Dallas area.

Arizona Chemical Elects Scharwachter Vice President

Albert Scharwachter, formerly sales manager, has been elected vice president of Arizona Chemical Company. Arizona is owned jointly by International Paper Company and American Cyanamid Company.

Scharwachter was associated with A. Klipstein & Company, a chemical firm, for years before it was acquired by Cyanamid in 1931 when Scharwachter became a department manager in Cyanamid's Industrial Chemicals Division. Arizona produces tall oil, sulfate turpentine and their derivatives from byproducts of International Paper Company's Kraft paper operations.

Storage elevator, overhead bin and scale house of the Service Bulk Mud Company at Liberty, Texas. The tanks were manufactured by Associated Steel Fabricators of Houston.

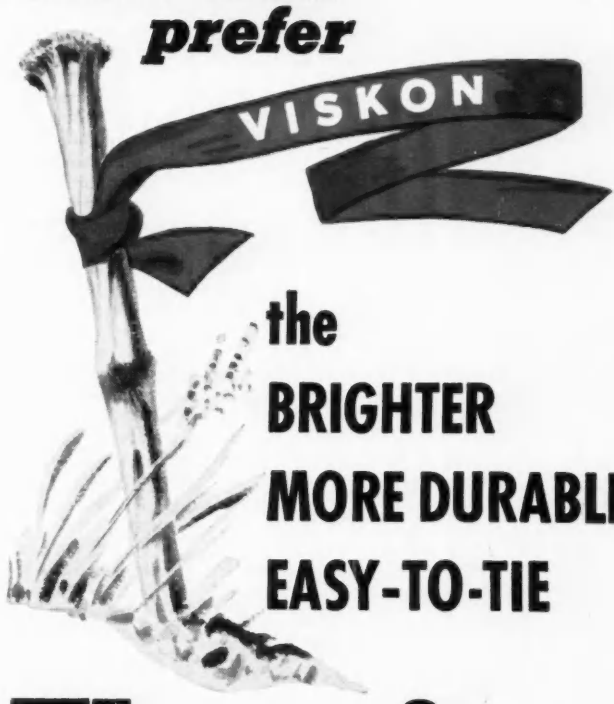
How BULK MUD from "SERVICE" helps REDUCE DRILLING COSTS!

1. **Saves man-hours and rig time.** One man can do as much work as five men unloading sack mud.
2. **Eliminates waste.** You pay only for the mud you use.
3. **Reduces hazards** of blowouts and lost circulation. Smooth mixture eliminates heavy and light streaks in mud column.
4. **Prompt service from "SERVICE."** If you operate in our territory, call us for immediate delivery of your next mud order.

SERVICE BULK MUD CO.

PHONE 542 **LIBERTY, TEXAS**

Fieldmen prefer



the BRIGHTER MORE DURABLE EASY-TO-TIE

Flagging Tape

VISKON flagging tape stays bright, won't fade in any weather conditions. Available in brilliant red—orange—blue—yellow—and white. VISKON can be used wet or dry—doesn't "rope"—and does not become brittle in cold weather. Supplied on a handy core to loop right on your belt. Is non-toxic. Easy to write on. Standard put-up 1½ inches wide, 300 feet to a roll—other sizes available.

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Please send information on VISKON plus free sample swatch of each survey flagging tape color.

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COMPANY_____

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NAME OF MY SUPPLIER_____

Fig. 115

Below Fig. 116

Greatest Name in Cable Tools

ACME

TRUSTWORTHY SINCE 1900

Markets The Drilling World's RUGGEDEST Rope Sockets

(Fig. 115) Ruggedness — what you look for first — is most manifest in Acme's Prosser (WL) Swivel Socket. This EXTRA inner-stamina results from 53-years' cumulated, specialized, superior toolmaking.

Acme's rigid analysis specifications steel — costing EXTRA; pyrometer controlled heat-treating and finest precision production facilities assure constant highest quality uniformity.

(Fig. 116) Acme's Burns (WL) Swivel Socket is a valuable TIME-SAVER . . . allows inspecting swivel without breaking joint. Its swivel action doesn't batter pin or stem — socket being solid below the side hole. Also prevents joint leakage.

All Acme Sockets meet highest "double standards" — ours for superior product and API's for specifications.

Write for Complete Information — including prices — on these SUPERIOR Acme Cable Tools.

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Export Office:
19 Rector St., New York 6, N.Y.

Foxboro Company Organizes Instrument Firm in Mexico

Announcing the organization of a Mexican affiliate, Graficas e Instrumentos, S. A., The Foxboro Company of Foxboro, Mass., strengthens its international service to users of industrial instruments for measurement and control. A key link in Foxboro's worldwide network, the new firm, located in Mexico City, has been incorporated for the future manufacture and assembly of instruments and instrument supplies. Its engineers, graduates of Foxboro's extensive training courses, will handle all types of repair work, from simple adjustments to major overhaul.

The new concern has obtained factory facilities adjacent to Schultz y Cia., Foxboro's sales representatives in Mexico, establishing close cooperation between the two companies an insuring quick, convenient service for instrument users in Mexico. Already in full production is the Chart department, printing Foxboro precision charts for all types of recording instruments.

The Mexican company is the third to join the list of Foxboro's international affiliates. Companies in London and Montreal, for more than twenty years, have manufactured the line of Foxboro instruments, helping to supply the many engineering firms who represent Foxboro throughout the world.

ACME DRILLING & FISHING TOOLS

There's More of EVERYTHING You Need in Acme Tools...

Acme's famous "Drilmor" Line not only provides a tool for every drilling or fishing operation but each tool possesses more of the finer functional features and superior product qualities you need for better in-hole results . . . because specialized toolmanship of over half-a-century accounts for the difference.

Driller's file isn't complete without Acme's Catalog and tool-use Manual and bit dressing (temperature color) chart. Free on request.

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION MEMBER

Orville E. Haley J. Daviss Collett

Associated Equipment Is Formed in Houston

Established to develop and produce oil field specialty products, the Associated Equipment Inc. of Houston, Texas, has opened formally with J. Daviss Collett as president and Orville E. Haley as vice president. The firm is ready to market the first of its products, a new acoustical fluid level recorder.

Collett, formerly with Atlantic Refining Company as an engineer, has recently had a consulting firm of which Associated Engineers, Inc. and Associated Equipment Inc. have been outgrowths. A specialist in seismic electronics since 1934, Haley spent six years with McCollum Exploration Company developing a process of adapting radar for offshore surveying and later became associated with Electro Technical Labs designing geophysical instruments.

Cincinnati Metalcrafts Sells Sebastian Lathe Division

The management of Cincinnati Metalcrafts, Inc., has announced the sale of the company's Sebastian Lathe Division to the Sheldon Machine Company of Chicago. All manufacturing operations will be moved to Sheldon's plant in Chicago.

The jigs, fixtures, and other production tools, along with the material, have already been shipped to Chicago. Cincinnati Metalcrafts plans to devote its entire plant and productive capacity to its major business of producing high-grade industrial sheet metal products to customer's order.

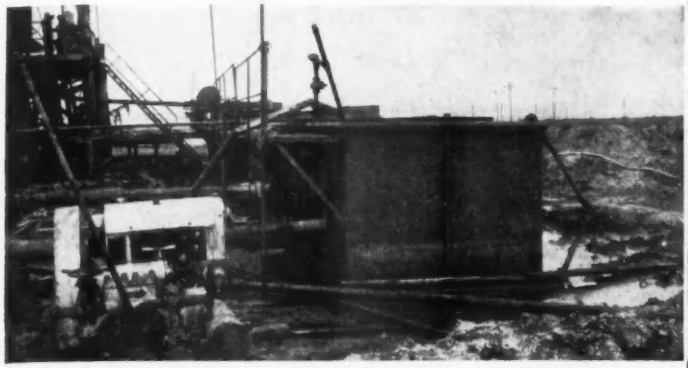
Goertz Named Sales Manager Of Axelson Manufacturing

Willard F. Goertz has been named general sales manager of the Alexson Manufacturing Company of Los Angeles, Calif., division of the Pressed Steel Car Company, Inc.

Willard F. Goertz

Joining Axelson Petroleum Equipment division soon after graduation from U. C. L. A. in 1927, Goertz has served with the company since then, working his way through a series of promotions from his first job, oil well pump inspector, to the post of California sales manager, to which he was appointed in 1950.

In his new position, Goertz will be assisted by J. R. Walker, sales manager, petroleum equipment division; J. L. Axelson, sales manager, engine lathes division; L. G. Martial, sales manager, aircraft components division; and G. Painter, sales manager, foundry division.



Mud System furnished by S&R Pierce Junction Field, Houston, Texas

S & R MUD PIT

Hundreds of S&R Mud Pits are in use by operators throughout the Oil Industry. S&R Mud Pits are practically indestructible . . . with any reasonable care in loading and transporting, they will give years of service.

Standard pits are 6' deep, 30' long, 7'6" wide and have a capacity of 234 barrels. Bottoms are 1/4" steel plate; sides of 3/16" or 1/4" as specified. Heavy reinforcing . . . 3" channel iron ribs on 36" centers . . . provides utmost strength and rigidity along the sides. Top cross braces are above the mud level in the tank, so that the interior is absolutely free of obstructions. A clean-out plate is furnished at one end.

S&R Steel Mud Pits are skidded on 6" H-Beams, with heavy cross-braces along the length. Skids are 8' wide and 33' long; the pits may be hauled on any standard oil field trailer. Beams are recessed at each end, so that the winch line may be snubbed or wrapped around the ends of the braces for speed, safety and convenience in loading and unloading.

Write for further information and catalog.

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Export: 42 Broadway, New York 4, N. Y.

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PROVEN GEOPHYSICS

The Amazing Attractometer

The latest and most modern method of geophysical exploration that shortens the route to petroleum reserves by rigid instrumental recordings, indicating the existence or not of hydrocarbon accumulations, the approximate depth and quantity underlying the tested area; ten locations for a major oil company without error. Surveys conducted on acreage basis for cash fee and chance to earn small override, oil payment, leases or other interest, where saturation is indicated in commercial quantities. Full information on request.

To establish conclusive proof of the accuracy of our geophysical work, we will test and record on tape bearing your signature one or more wildcat locations in advance of drilling, indicating the existence or not of petroleum in commercial quantities underlying the tested areas and at what depth it may be found.

GEOPHYSICAL SURVEY SYNDICATE

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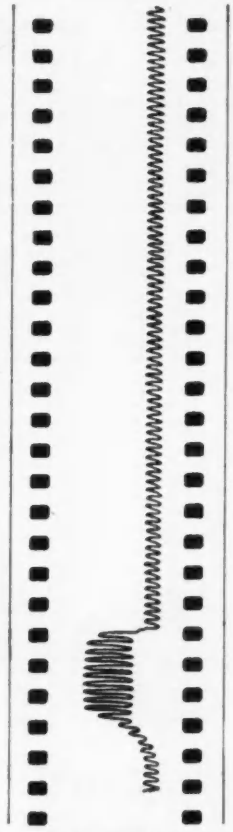
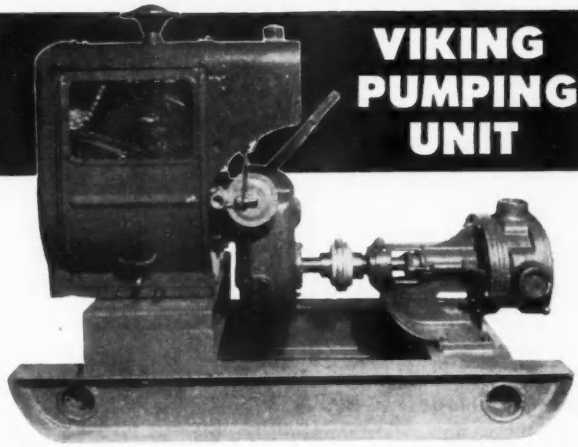


Specimen of tape indicating saturation

Another Efficient VIKING PUMPING UNIT



Viking pumps are giving top performance wherever used in the petro-chemical industry. The above installation is serving a major pipeline company and consists of: a Viking Model L-124, Size 2" Standard fitted heavy duty rotary pump mounted on welded steel skids and direct connected through 7 F Falk coupling to a 2 cylinder Air Cooled Power Unit.

Write for new literature or engineering counsel.

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Clark Equipment Company Appoints Nebraska Dealer

The Christy Equipment Company, Omaha, Neb., has been appointed by Clark Equipment Company, Battle Creek, Mich., as a new dealer for Clark's fork lift trucks, powered hand trucks and towing tractors. Heading the new dealership are Gordon K. Christy and Charles O. Christy. The Omaha dealership replaces the Clark dealership in Sioux Falls, S. D.

Gordon Christy has been a salesman for Clark Equipment Company for eight years and gained selling experience in the territories of Los Angeles, Denver and Chicago. Charles Christi has been maintenance superintendent for the California Polytechnic College at San Damis, Calif. for the past ten years. He has a background in the repair, maintenance and operation of mechanical equipment.

Thermoid Names Runkle Division Superintendent

Thermoid Company, Trenton, N. J., has announced the appointment of A. K. (Ed) Runkle to the post of Superintendent of the company's Friction Division.

A native of Harrisburg, Pa., Runkle has been employed by Thermoid for the past 20 years, in all phases of friction manufacturing. Runkle will take over the former duties of Carl P. Brockway, recently elected president of the company's subsidiary, Asbestos Manufacturing Company, Huntington, Ind.

RED DEVIL

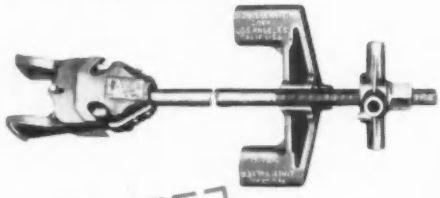
"DIA-HARD" Slush Pump Liners

High Hardness and High Carbon The Combination for Longer Life

Maximum wear resistance results from the combination of *high hardness* and *high carbon*, not from high hardness alone. The deep wear resistant case of Red Devil "Dia-Hard" liners has a uniform *hardness* of 62-64 Rockwell "C" and a uniform *high carbon* content in excess of 1.00%. This combination of a case of high hardness and abrasive resistant carbides with a core of high tensile strength and ductility is obtainable only by our special "Dia-Hard" process.

Integrally forged liner glands; precision honed bore. Outside dimensions are accurately machined assuring perfect working fits with liner packing assembly and pump cylinder for positive sealing against modern high pressure pump operation.

Write for Price Catalog No. P-120.



LINER PULLERS

The Red Devil Liner Puller is a strong, heavy duty tool capable of pulling the most obstinate liner. Simple in operation, there are no pins, connecting links or other small parts to bend, shear, break or lose. Two Types: "Universal Type" (as illustrated) for slush pumps, the "Expanding Grip Type" for pulling thin wall tube-type liners in small pumps. *Write for Price Catalog No. P-122.*

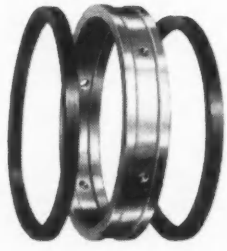
TELL-TALE LINER PACKING ASSEMBLIES

Give warning before pump damage

Tell-Tale Liner Packing Assembly consists of two "Dia-Tex" oil and heat resistant sealing rings separated by a precision machined corrosion-resistant steel lantern ring. Internal leakage is detected instantly through the tell-tale hole before costly fluid cuts can damage the slush pump. For information on Red Devil Tell-Tale Packing Assembly or "Dia-Tex" Liner Sealing Rings *write for Price Catalog No. P-121.*

Consult Composite Catalog

for full information on Red Devil Products or write for price catalogs. Red Devil Products are available through your supply store.



Oil Well Manufacturing Corp.

6008 S. ALAMEDA STREET, LOS ANGELES 1, CALIFORNIA

William B. Agocs Joins Aero Service Corporation

Dr. William B. Agocs, formerly head of the Department of Geophysics of the University of Tulsa, Okla., has joined the staff of Aero Service Corporation, Philadelphia, worldwide aerial mapping and exploration organization.

William B. Agocs

Dr. Agocs will be available as a consultant on airborne magnetometer surveys and other geophysical survey problems. He was associated with new mineral finds with the aid of aerial surveys in the United States and Canada, as well as oil exploration in domestic and foreign areas.

In his 19 years experience in geophysical exploration, both by ground and aerial methods, Dr. Agocs has been in the teaching field as well as active in oil exploration and consulting work, having served as geophysicist for Gulf Research and Development Co. in Venezuela, Kuwait, England and Denmark and as chief geophysicist for Venezuelan Atlantic Refining Company at Caracas. He has been at the University of Tulsa for the past three years.

American Pipe and Steel Announces Promotions

Carl B. Dahlberg, formerly sales manager of American Pipe & Steel Corporation of Alhambra, Calif., has been elected to the board of directors and made vice president - sales according to an announcement by Jack Lane, president and general manager. During the last four years Dahlberg headed up the largest sales growth in the company's history.

Carl B. Dahlberg

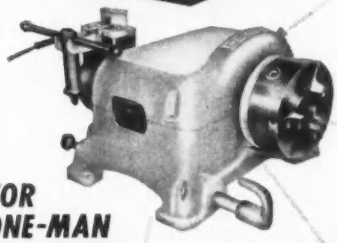
Also elected to the board is L. E. Howard, Jr., formerly with the Bank of America. Howard will be secretary-treasurer of the company. Well known in commercial banking and manufacturing circles for 20 years, Howard was formerly with the Bank of America where he supervised large loans to metal fabricators and aircraft manufacturers. During World War II he served as acting treasurer of the Philippine Government at the time of the Leyte invasion.

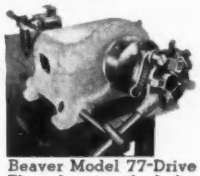
Rear Admiral R. A. J. English, U. S. N. (ret.) was elected vice president—production and engineering administration. A graduate of U. S. Naval Academy and the Naval War College, English earned his M. S. at Columbia University. As naval war plans officer at Eisenhower's headquarters in Algiers, he planned and executed the landing operations in North Africa, Sicily, Italy and Southern France.

This strengthening of management, it was stated, is another step in the company's program of expansion, which contemplates a merger that would further diversify the corporation's products, markets and facilities. The company now has

Introducing the **NEW**
BEAVER Lightweight Aluminum
Model-D Power Drive
$202.50

Beaver No. 102 — P D Wide Roll Pipe Cutter made especially for power drives.

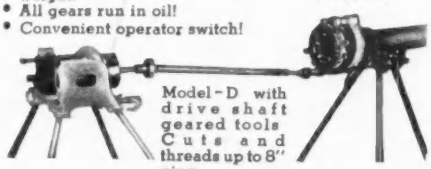




Beaver Model 77-Drive Threader is ideal for use with new Model-D.

FOR ONE-MAN OPERATION AND PORTABILITY

- Works on bench, truck or pipe legs!
- Flat top serves as tool tray!
- Side openings give motor ventilation and act as hand grips for moving!
- Approximately 100 lbs. net weight!
- All gears run in oil!
- Convenient operator switch!
- Trouble-free, heavy-duty chuck with tons of gripping pressure!
- Safety-locked switch lever!
- Bronze spindle bearings!
- Attractive baked enamel finish!
- Parts interchangeable with Model-C.



Model-D with drive shaft geared tools Cuts and threads up to 8" pipe.

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AUTO-RELEASE WIRE LINE STRIPPER

Finest in the field. King Strippers represent outstanding advances in design and construction that assure long life and maximum operating efficiency:

- POSITIVE LATCH will not release by accident or surge of pressure.
- SURE RELEASE MECHANISM operated by rope socket striking bottom of the stripper.
- NON-SPARKING MATERIALS minimize fire hazard.
- ROLLER WIRE LINE GUIDES on hardened steel pins.
- SIDE OPENINGS for inserting packing while line is in the hole.
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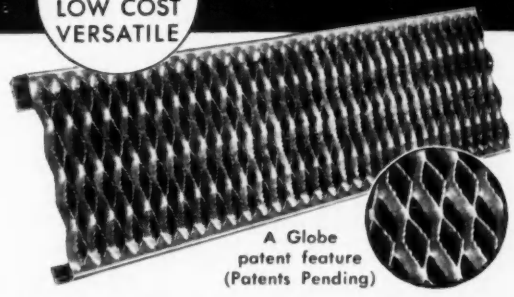

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Not welded, not riveted, not expanded, all one piece of material, gives a non-skid surface in *all* directions, a diamond shaped pattern with open space area in excess of 75% of surface, easily cleaned, sanitary. Simple to install, ideal for on-the-job fabricating, replaces existing grating with no supporting structural changes necessary. Strong yet light in weight. Ideal for stair treads, work platforms, catwalks, flooring, running board steps, in fact for any purpose where safe flooring is a factor. Available in steel or aluminum. Write for new catalog, showing new low prices, methods of application, typical installations and list of nationally known users.

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High temperature KOPR-KOTE with fine ground metallic copper, puts an end to leaks in casing and tubing. Hundreds of wells cased and tubed without a "leaker" using JET-LUBE'S KOPR-KOTE. Batch controlled. Unconditionally guaranteed.

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global distribution of its products and has extended its field construction operations of Guam and other Pacific islands. Manufacturing plants are maintained at Alhambra and Hemet, Calif., and negotiations are in progress for additional facilities at Blythe, Calif.

The company is the only west coast manufacturer offering a complete line of oil field production equipment—separators, treaters, heaters, tanks—and holds the exclusive California license for the manufacture and sale of the products of the National Tank Company of Tulsa, Okla.

Century Geophysical Names R. A. Broding Vice President

R. A. Broding has been named vice president of Century Geophysical Corporation, Tulsa. Formerly with Magnolia Petroleum Company, Broding has been research associate in Magnolia's research and special instrumentation group since 1949. A graduate of St. John's University, Broding took preengineering at Minnesota University and communications at Southern Methodist University. During World War II he served with the Naval Ordnance Laboratory in Washington, D. C.

R. A. Broding

Daniel Moves Henry to Odessa, Announces Three Other Changes

William R. Henry has been named district manager of West Texas at Daniel Orifice Fitting Company. He will make his headquarters at the company's sales offices and warehouse at Odessa, Texas. He spent several years in the engineering department at the company's main offices and plant in Los Angeles before transferring to sales.

In other changes at Daniel:

W. C. (Bill) Watson, formerly associated with W-K-M Company and the Industrial Valve division of Cameron Iron Works, joined the company's sales force at Odessa.

Merton Freudenthal, in Daniel's engineering department in Houston for three years, has been placed in charge of the company's new Dallas sales office, which was transferred from Ft. Worth.

J. R. Wilson, for the past five years technical assistant in the Pipe Line division of Southern Counties Gas Company of California, has been added to the company's sales staff at Los Angeles.

Stardrill-Keystone Company Announces Consolidation

Consolidation of the Acme Fishing Tool Company of Parkersburg, W. Va., with the Stardrill-Keystone Company has been announced.

Stardrill-Keystone history dates back to 1878. Acme Fishing Tool Company was founded in 1900. The Acme tools have long been used in Stardrill-Keystone machines. The joining of these two companies means a complete integration and rounding out of the Stardrill-Keystone operation. The Acme Fishing Tool Company will be operated as a division of Stardrill-Keystone.

Slush Pump RODS & LINERS—

In all stock sizes or to your order.

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New Books, Maps and Movies

A PRIMER OF OIL PIPE LINE OPERATION, first edition, April, 1953. $2 postpaid in the U. S., $2.25 postpaid elsewhere.

This manual is Volume 1 in the series on oil pipe line transportation practices being published under the auspices of the Division of Transportation of the API. The publication gives an over-all picture of how the pipe lines of America move some five million barrels of petroleum and petroleum products daily. It reviews the early history of pipe lines and carries chapters on personnel, gathering systems, main line stations, maintenance work, products line operations, warehousing, and business practices. Included also is a glossary of pipe line terminology.

BULK PLANT DIRECTORY, Liquefied Petroleum Gas Association, 11 S. LaSalle Street, Chicago 3, Ill. $5, members; $10, non-members.

This directory lists alphabetically by states the names and addresses of almost 3000 companies operating one or more bulk LP-Gas distribution plants. The 78-page booklet was designed to be useful to appliance and equipment manufacturers and other suppliers to the LPG industry.

INDUSTRIAL BRAZING, H. R. Brooker and E. V. Beatson, B. Sc. (Eng.), AMIEE. Published for "Welding and Metal Fabrication" by Iliffe & Sons Limited, London, S. E. I., $7.50.

This is the first full length authoritative study of brazing as a process for metal fabrication. The present work covers all modern brazing methods: torch, furnace, H. F. induction, resistance, salt bath and dip, while the special considerations necessary in work on aluminum, stainless steels, beryllium copper, cemented carbides and vacuum tube construction are dealt with separately. The volume will prove of value to those engaged in industries operating brazing processes and to those responsible for the design of brazed assemblies. The book is illustrated with more than 200 photographs and diagrams depicting various phases of the different processes and a vast amount of reference material is provided in the text and in the 32 tables. The book will be handled through the British Book Centre of New York, 122 East 55th Street.

RULES AND REGULATIONS OF THE TEXAS RAILROAD COMMISSION, R. W. Byram and Company, Drawer M, Capitol Station, Austin, Texas. $75.

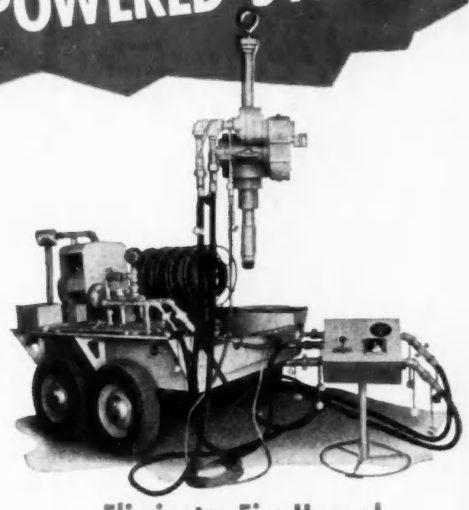
This publication consists of a complete set of rules in three loose leaf binders and new supplements are supplied each month for one year at the price quoted. Each section is indexed so that regulations for the districts in each area or field may be found easily. Headings on individual orders show the date the rules were entered originally and dates of amendments.

GEOLOGY OF AGUA FRIA QUADRANGLE, Brewster County, Texas, C. Gardley Moon, Bureau of Economic Geology, The University of Texas, Report of Investigations—No. 15, University Station, Box B, Austin, Texas. 50 cents. February, 1953.

This paper continues the publication of data on Trans-Pecos Texas geology and is a part of the Bureau's project on that area. A geologic map in color accompanies the paper and several structure sections of the quandrangle are included. Wholetone plates illustrate the Boquillas-Terlingua sequence, tuffs and topographic forms, and the Buck Hill volcanic series. The Boquillas-Terlingua boundary problem is discussed in some detail.

The Easiest and Quickest Powered Swivel to Use

THE BOWEN POWERED SWIVEL



Complete trailer mounting provides ease of getting the Swivel to the job. The use of self-sealing couplings insures ease of setting up Swivel. Direction of rotation, speed and torque are easily controlled by the operator from the control box. Swiveling hose connection eliminates any possibility of contaminating the Swivel because it is a separate, easily installed unit located below the rotating unit.

Eliminates Fire Hazard

Locating the trailer-mounted prime mover unit, which is equipped with spark-proof ignition and exhaust, at a safe distance from the well prevents all danger of fire hazard.

BOWEN POWERED SWIVELS

are used for all types of light and medium rotary operations because they eliminate the necessity of moving in Kellys, rotary tables or other heavy equipment for light or medium short-time rotary work and because they eliminate the inefficiency and even danger of rotating strings by hand. Bowen Powered Swivels are sensitive enough for small torque operations like cutting with macaroni or sucker rods, yet sufficiently rugged to do clean-out and milling jobs. They are available in two types for light-duty operations and medium-duty rotary work.

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FOR SAFETY'S SAKE always get the original Demco "No Chip" soft end tong dies! They help reduce accidents on the derrick floor. And even on flame hardened surfaces Demco Tong Dies give you maximum gripping power! They're reversible, for longer wear and easy installation!

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SQUEAKS from the BULLWHEEL

You Tell Mama!

A teacher was defining the word "recuperate."

"For instance," she said to one small boy, "your father worked hard all day, and he's tired and worn out, isn't he?"

"Yes, ma'am."

"Then, when night comes and he's through for the day, what does he do?"

"Gee," said the youngster, "That's what mother wants to know too."

•

It's All in a Name

A man named Joe Hogbristle appeared in court to have his name legally changed. The judge nodded understandingly and asked, "What name do you want to take?"

"Frank Hogbristle. I'm sick and tired of hearing people say, 'Hi, Joe, whaddya know.'"

•

Smarty!

"When I was a young man," said the father to his indolent son, "I worked 12 hours every day."

"I admire your youthful energy, Dad," answered the modern lad, "but I admire still more the mature wisdom that led you to stop it!"

•

Ole George

A train passenger rushed excitedly up to a conductor and exclaimed, "Conductor, that man sitting opposite me is crazy—he claims he is George Washington. "The trainman thought a moment and then said, "Take it easy, Lady; I'll take care of the situation." Then, stepping down the aisle he began yelling loudly: "Next Station, Mount Vernon!"

•

Inefficient

Out in the middle of nowhere, two trains sped toward each other on the same track until they collided with a tremendous crash. Reporters flocked to the scene, and one of them was questioning Slim, an old cowhand who was the only witness to the disaster.

"Tell me, Slim, what did you think when you saw those two trains coming together?"

Slim drawled his answer: "I thought that was one hell of a way to run a railroad."

•

Strategy

Young Married Man: "When I arrived home last night, my wife greeted me with a big kiss. She had a swell dinner ready and afterwards she wouldn't let me help her with the dishes, but made me sit in the living room and read the paper."

Old Married Man: "And how did you like her new dress?"

GORMAN-RUPP PUMPS

The PELICAN

THE *Lowest* PRICED TWO-INCH PUMP OF ITS CAPACITY ON THE MARKET

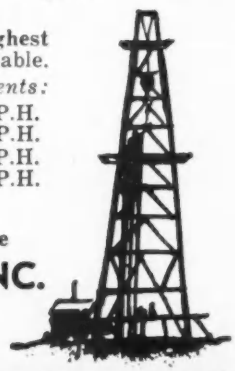
Gorman-Rupp self-priming centrifugal pumps are especially designed to meet the toughest requirements. The Pelican has many useful applications around a lease and -- it challenges any pump its size and type to equal its performance -- it never quits.

Gorman-Rupp pumps are the **Quickest Priming, Highest Priming, Fastest Pumping** and **Most Reliable** pumps available.

There's a choice of four lightweights for any requirements:

The Midget 1½"	Weight 62 lbs.	5500 G.P.H.
The Pelican 2"	Weight 70 lbs.	7500 G.P.H.
The Hawk 2"	Weight 110 lbs.	10,000 G.P.H.
The Eagle 3"	Weight 117 lbs.	18,000 G.P.H.

Ask for Bulletin No. 7-LW-13



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NEW SERVICES • NEW TOOLS
NEW WAYS OF DOING THINGS

Latest News About New Tools, Techniques and Services

How To Get BETTER RESULTS from Perforating

Improved McCullough Perforators Get More Oil in Less Rig Time

HERE'S WHY

(Summary of advantages of McCullough Perforating Service)

IMPROVED McCULLOUGH M-3 BURRLESS BULLET PERFORATORS

1. 25% deeper penetration.
2. Burrless holes.
3. Simultaneous firing.
4. Holds all world records for speed and efficiency.
5. More sizes and types.
6. Deflecting bullets.
7. Up to 90 or more shots on one run in well.
8. Up to 30 or more feet of zone perforated on one run.
9. Up to six shots per foot.
10. Exact hole pattern and spacing.
11. World's hardest shooting Bullet Gun Perforator.

IMPROVED McCULLOUGH GLASS JET PERFORATORS

1. No slugs or carrots.
2. Flexible, junk-free strip carriers.
3. A type and size for every purpose.
4. Up to 600 shots at one time.
5. Up to six shots per foot.
6. Up to 100 feet of zone perforated on one run.
7. Simultaneous firing.
8. Cleaner, straighter holes.
9. More power in small casing.
10. World's hardest shooting Jet Gun Perforator.

HERE'S PROOF

(Actual jobs selected from recent McCullough field reports.)

1. New Well—3½", 30-shot McCullough M-3 Burrless Bullet Perforator used to shoot 600 holes between 12,400 feet and 12,500 feet through 5½" O.D. cemented casing. Formation was hard limestone. The well produced 1560 B/D after perforating. Time on the job—six hours.

2. This well was previously perforated by two different companies without results because of an excessively thick cement sheath behind the 7" O.D., 23 lb. casing. Six holes were shot between 6688 feet and 6690 feet with a 4¼" McCullough Glass Jet Perforator and Steel Strip Carrier. The well produced 50 B/D. Time on the job—two hours.

3. New Well. 5½" O.D., 17 lb. casing was cemented in 9" hole. Hard limestone formation and an extra thick cement sheath. 3½", 30-shot McCullough M-3 Burrless Bullet Perforator shot 120 holes between 4430 feet and 4460 feet in two hours rig time for production of 100 B/D. A fine well for the field.

4. Formerly perforated for a production of 210 B/D. McCullough Glass Jet Perforator and Steel Strip Carrier shot 600 holes below 6000 feet through 7" casing. Time on the job—eleven hours. Production increased to 676 B/D.

Enthusiastic reports about the improved penetrating power of McCullough Perforators are coming in from operators everywhere. Find out how this can benefit you.

SEND FOR OUR NEW, FREE BOOKLET "HOW TO GET MORE OIL"—32 pages of factual information on the improved McCullough M-3 Burrless Bullet and Glass Jet perforators.

PERFORATING, RADIATION LOGGING, AND FISHING TOOL SERVICE—ANYWHERE—ANYTIME.

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Fountain of Youth

Harry was tired, listless, run down, couldn't sleep, had lost his pep and was the victim of sour stomach—and worse than that, realized that he was middle-aged. Finally won over by the advertisements for a widely-publicized patent medicine, he bought a bottle and drank it down. That evening, he went to bed and fell asleep—and slept, and slept, and slept. The next morning his wife went in to wake him up.

He stretched and yawned and scratched his head, then opened one eye and said: "All right, Ma, I'll get up—but I ain't going to school!"

•

Independent Patient

Small son: "I'm not afraid of going to the hospital, mother. I'll be brave and take the medicine, and do everything they say—except—I'm not going to let them palm off a baby on me like they did you—I want a pup."

•

Disgusted Onlooker

The little child was sitting demurely on the couch, watching her mother smoke a cigaret. Her little nose wrinkled and in her pale blue eyes was an expression of childish disillusionment. Finally, unable to stand it any longer, she burst out in her quavering falsetto:

"Mother, when in hell are you going to learn to inhale?"

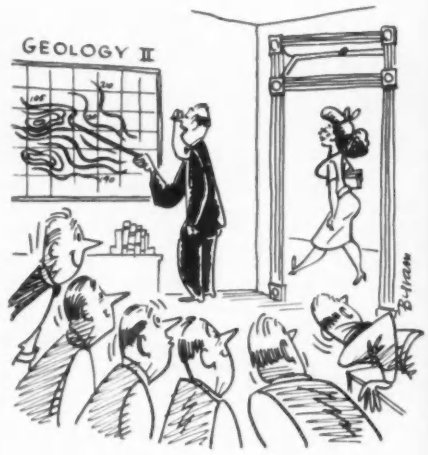
•

Confession

When the conductor reached them the woman handed him a full-fare ticket and a half-fare ticket. He looked at the strapping lad sitting beside her, and said: "You'll have to pay full fare for that boy. He must be over 14."

"How can he be over 14 when I've been married only 12 years?" the woman demanded.

"Madam," replied the conductor icily, "I'm here to receive fares, not confessions."



". . . And now, please follow the contours closely!"

Mistaken Identity

"Why sure, we can put you up for the night," said the farmer with a knowing wink, "if you don't mind sharing a room with a red-headed school teacher."

"Now just hold on," snapped the salesman, "I'll have you know all traveling salesmen aren't like those in the stories you hear. I happen to be a gentleman!"

"That's fine," replied the farmer, "so's the red-headed school teacher."

•

Fearless

Butch presumably had retired for the night, but he began to call downstairs that there was a spider in his room. No one paid much attention, but when Butch's yells became louder, his mother called up to him: "Now, Butch, go to sleep. You're not afraid of that spider."

A short pause. Then from upstairs came the plaintive response: "Then why am I standing out here in the hall?"

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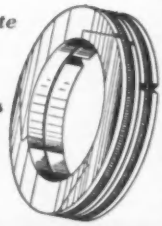

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"Well, everything *else* around here is shrouded in thick veils of secrecy."

Just Ask Me!

During operations in Korea an American soldier was brought into the hospital station with a severe bullet wound in his left thigh and for several days the surgeons were engaged in attempting to locate the missle. Their probings gave the soldier much pain until he could bear it no longer.

"Doc," he explained, "what are you trying to do to me?"

"We are looking for the bullet that wounded you," was the reply.

"Well, why didn't you say so!" retorted the G.I. "It's in my pants pocket."

•

Master of Situation

Two salesmen were sitting in a local cafe when in walked a young fellow with a beautiful girl on his arm.

Interested, one of the salesmen sent this note to the young lady's escort:

"I'm sure I studied with you at Harvard and my friend thinks he was a classmate of yours at Yale. May we come over to your table and straighten this out?"

The reply read: "Sorry gents, but I studied at the National School of Taxidermy and I'm taking care of this pigeon myself."

•

Sympathy

Bootblack: "Shine your shoes, mister?"

Man: "No."

Bootblack: "Shine 'em so you can see your face?"

Man: "No."

Bootblack: "Don't blame you."

•

Easy Way Out

"You look all in today, Bill. What's the trouble?"

Bill: "Well, I didn't get home until after daylight and I was just undressing when my wife woke up and said: 'Aren't you getting up pretty early, Bill?' In order to save an argument, I put on my clothes and came down to the office."

•

Goodbye Forever

The head of the family had been transferred from Texas. The night before their departure the little daughter was overheard at her prayers.

"God bless Mommy, Daddy and little brother. And this is goodbye, God . . . we're leaving Texas tomorrow."

That Coward

A Boston salesman visiting the Lone Star State was listening to one particular Texan boasting about the heroes of the Alamo who, almost alone, held off whole armies.

"I'll bet you never had anybody so brave around Boston," challenged the Texan.

"Did you ever hear of Paul Revere?" asked the Bostonian.

"Paul Revere?" answered the Texan. "Wasn't he the fellow who ran for help?"

•

The Last Word

A seven-year-old boy was smoking to his heart's content on the street when an elderly woman walked up to him and exclaimed: "Didn't your mother ever tell you not to smoke?"

The little boy looked up and very nonchalantly inquired: "Didn't your mother ever tell you not to speak to strange men on the street?"

•

I'll Show Him!

Murphy: "What's that hump on your chest, Pat?"

Pat (in a whisper): "Dynamite. I'm waitin' for Casey. Every time he meets me he slaps me on the chest and breaks me pipe. Next time he does it, he'll blow his hand off."

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